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UK METEOROLOGICAL OFFICE GLOBAL DATA MONITORING REPORT

MARCH, 94

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2. Global Data Monitoring Statistics

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIBU observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12 UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of AIREP/ASDAR reports received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 ms^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 5-8 show wind statistics for AIREP/ASDAR in the layer 70-500 hPa. Observations with a vector wind difference > 60 $m\ s^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (ms^{-1})
7	RMS observation-background vector (ms^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-12. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic(COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 7 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 8 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 9 - 12 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias| ≥ 4 hPa (pressure),
≥ 5 $m\ s^{-1}$ (wind speed),
≥ 30 degrees (direction).

2.SD ≥ 6 hPa (pressure),
≥ 80 degrees (direction).

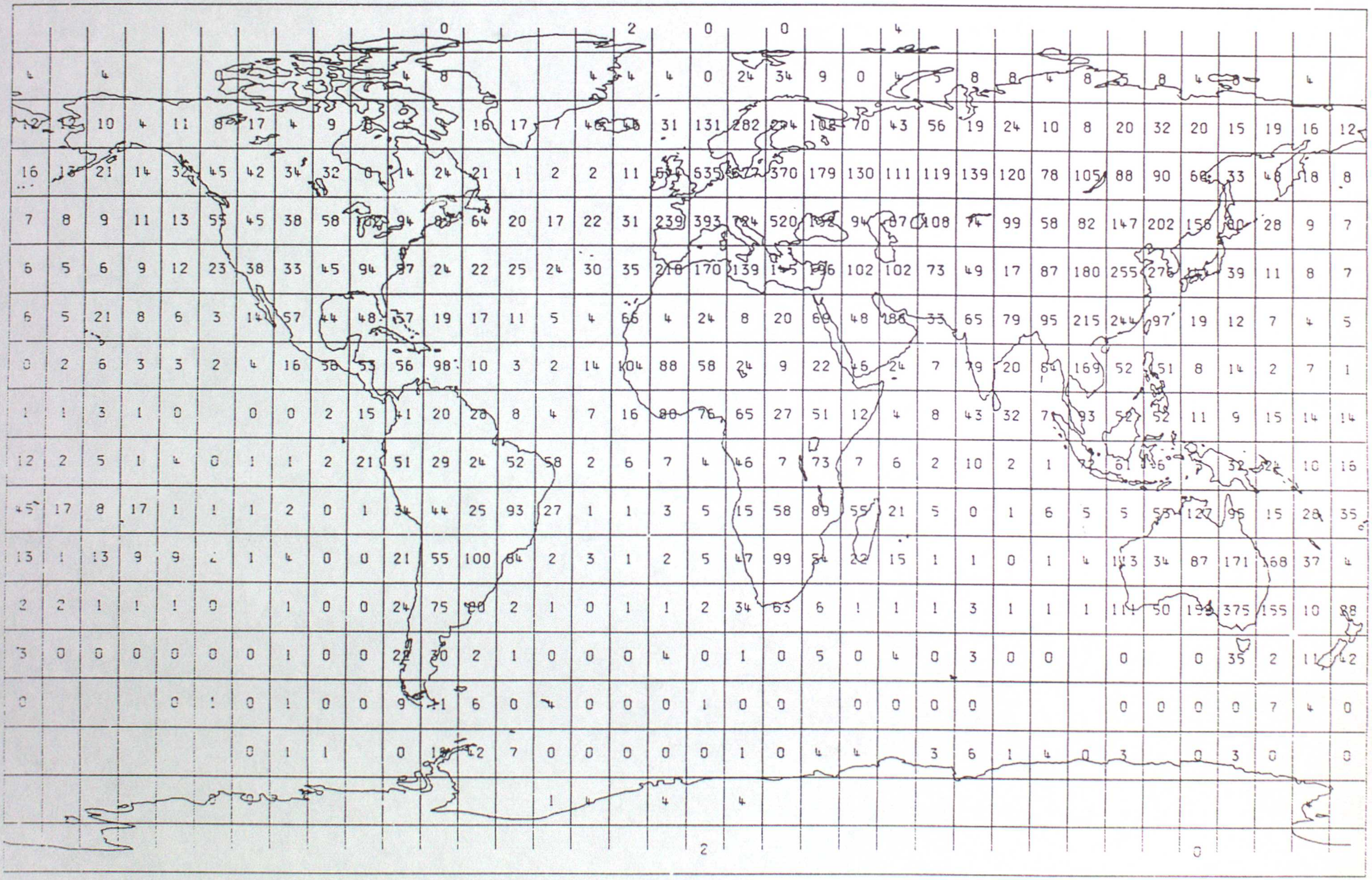
3.PGE ≥ 25

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA-LEVEL PRESSURE									
C6KB6	ALL	MSLP	SUR	34	0	0	3.7	5.9	6.9
C6KM6	ALL	MSLP	SUR	22	0	0	2.6	-5.1	5.8
D5NE	ALL	MSLP	SUR	25	0	0	2.5	4.7	5.3
ELFN7	ALL	MSLP	SUR	42	0	0	1.4	4.3	4.6
ELIU4	ALL	MSLP	SUR	24	1	4	2.0	-6.5	6.8
ELND2	ALL	MSLP	SUR	30	0	0	1.6	4.1	4.4
LAOO4	ALL	MSLP	SUR	31	0	0	2.8	4.2	5.0
NQST	ALL	MSLP	SUR	20	0	0	2.4	-5.2	5.7
SCYN	ALL	MSLP	SUR	58	1	2	2.2	5.2	5.7
UHLK	ALL	MSLP	SUR	24	0	0	3.1	6.3	7.0
UHUN	ALL	MSLP	SUR	43	0	0	1.8	5.6	5.9
UPIU	ALL	MSLP	SUR	29	1	3	1.6	5.2	5.4
UYDW	ALL	MSLP	SUR	20	1	5	2.9	4.6	5.4
UYKD	ALL	MSLP	SUR	42	25	60	5.6	-3.6	6.7
VRUA4	ALL	MSLP	SUR	115	0	0	1.5	4.0	4.3
YJXR9	ALL	MSLP	SUR	38	0	0	2.7	-4.1	4.9
3EAY5	ALL	MSLP	SUR	23	1	4	1.6	-4.3	4.6
3FBK	ALL	MSLP	SUR	31	0	0	0.9	9.3	9.3
3FYW3	ALL	MSLP	SUR	21	8	38	2.1	-3.2	3.8
74002	ALL	MSLP	SUR	174	38	22	3.2	-8.3	8.9
WIND SPEED									
CFD2885	ALL	SPEED	SUR	26	0	0	3.3	6.4	7.3
C6KF2	ALL	SPEED	SUR	23	0	0	2.9	5.3	6.0
DGNB	ALL	SPEED	SUR	44	1	2	3.9	5.2	6.5
ELLE9	ALL	SPEED	SUR	84	1	1	5.3	9.5	10.9
ELOG7	ALL	SPEED	SUR	33	1	3	3.5	5.5	6.5
FNIH	ALL	SPEED	SUR	88	1	1	4.2	7.6	8.7
GTAB	ALL	SPEED	SUR	45	0	0	3.0	-5.0	5.8
PJGK	ALL	SPEED	SUR	23	0	0	3.2	6.0	6.8
SVKF	ALL	SPEED	SUR	21	0	0	3.5	6.1	7.0
SXYY	ALL	SPEED	SUR	35	1	3	5.6	8.6	10.3
VRIZ	ALL	SPEED	SUR	37	3	8	6.9	5.4	8.8
YJXL2	ALL	SPEED	SUR	22	2	9	4.7	11.1	12.1
62414	ALL	SPEED	SUR	26	0	0	4.9	5.3	7.2
9KKF	ALL	SPEED	SUR	53	0	0	4.6	5.8	7.4
WIND DIRECTION									
CG2614	ALL	DIRN.	SUR	41	0	0	40.7	37.8	55.5
GBBM	ALL	DIRN.	SUR	20	0	0	62.1	-32.0	69.8
3FJH3	ALL	DIRN.	SUR	25	0	0	48.9	-32.2	58.6
46013	ALL	DIRN.	SUR	63	0	0	22.0	32.0	38.9
46025	ALL	DIRN.	SUR	20	0	0	54.6	-41.2	68.4
46045	ALL	DIRN.	SUR	34	0	0	90.1	-4.2	90.2
46053	ALL	DIRN.	SUR	49	0	0	52.6	-50.7	73.1
46131	ALL	DIRN.	SUR	37	0	0	43.6	-57.4	72.1
46146	ALL	DIRN.	SUR	47	0	0	49.0	-45.1	66.6
46147	ALL	DIRN.	SUR	89	0	0	28.2	-30.8	41.7
46181	ALL	DIRN.	SUR	30	0	0	96.3	2.3	96.3
51304	ALL	DIRN.	SUR	26	0	0	14.7	-44.1	46.5
52006	ALL	DIRN.	SUR	24	0	0	20.1	-66.5	69.5
52007	ALL	DIRN.	SUR	20	0	0	94.1	21.5	96.6
63006	ALL	DIRN.	SUR	329	0	0	45.6	-36.7	58.6
9KWA	ALL	DIRN.	SUR	20	0	0	37.9	-37.3	53.2

AVAILABILITY - SHIP/SYNOP - MARCH 1994

FIGURE 1

MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 20074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7 8 9 11 13 55 45 38 58 102 94 83 64 20 17 22 31 239 393 724 520 152 94 87 108 74 99 58 82 147 202 156 80 28 9 7
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1 1 3 1 0 0 0 2 15 41 20 28 8 4 7 16 80 76 65 27 51 12 4 8 43 32 7 93 52 52 11 9 15 14 14
12 2 5 1 4 0 1 1 2 21 51 29 24 52 58 2 6 7 4 46 7 73 7 6 2 10 2 1 72 61 [illegible] 7 32 32 10 16
45 17 8 17 1 1 1 2 0 1 34 44 25 93 27 1 1 3 5 15 58 89 55 21 5 0 1 6 5 5 53 127 95 15 28 35
13 1 13 9 9 2 1 4 0 0 21 55 100 84 2 3 1 2 5 47 99 54 22 15 1 1 0 1 4 113 34 87 171 168 37 4
2 2 1 1 1 0 1 0 0 24 75 80 2 1 0 1 1 2 34 63 6 1 1 1 3 1 1 1 111 50 193 375 155 10 88
3 0 0 0 0 0 0 1 0 0 22 30 2 1 0 0 0 4 0 1 0 5 0 4 0 3 0 0 0 0 35 2 11 42
0 0 1 0 1 0 0 9 11 6 0 4 0 0 0 1 0 0 0 0 0 0 0 0 0 0 7 4 0
0 1 1 0 [illegible] 42 7 0 0 0 0 0 1 0 4 4 3 6 1 4 0 3 0 3 0 0
1 4 4 4
2 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias| ≥ 4 hPa (pressure),
≥ 5 m s^{-1} (wind speed),
≥ 30 degrees (direction).

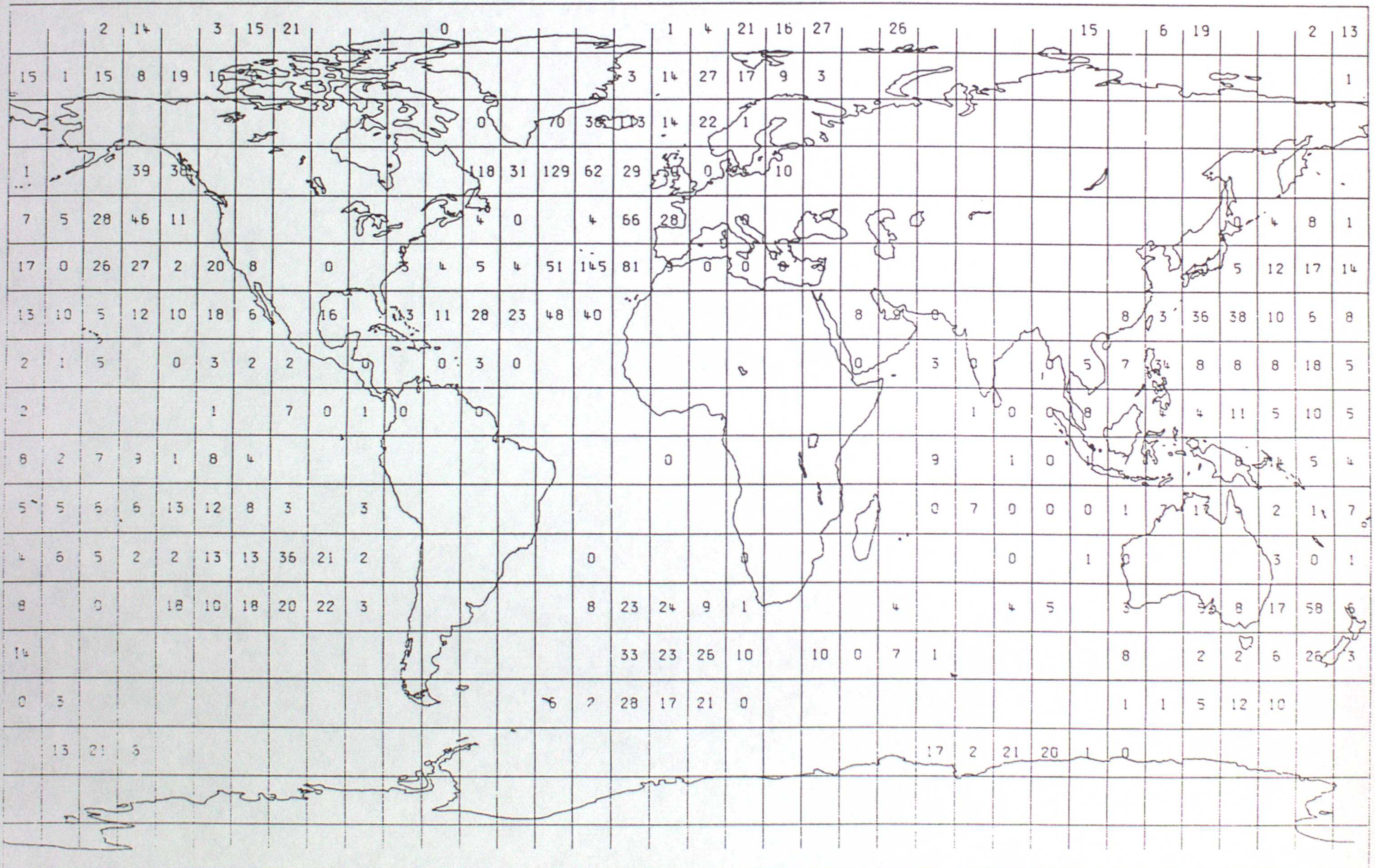
2.SD ≥ 6 hPa (pressure),
≥ 80 degrees (direction).

3.PGE ≥ 25.

```
IDENTIFIER  LAT.  LONG.  HOUR  ELEM   LEVEL NOBS  NGE  PGE    SD   BIAS   RMS

MEAN SEA-LEVEL PRESSURE

17569      -31.4  -12.9  ALL   MSLP   SUR   279   207   74   2.1   -2.5   3.3
25550       85.7 -145.1  ALL   MSLP   SUR   209     1    0   2.5    4.1   4.8
25561       56.9  -37.3  ALL   MSLP   SUR   531     0    0   3.1    4.0   5.1
44616       58.2  -10.6  ALL   MSLP   SUR   136    33   24   7.2   -2.4   7.6
44728       59.9   -5.5  ALL   MSLP   SUR   154    24   16   8.0   -0.2   8.1

56509      -47.7 -174.8  ALL   MSLP   SUR   394   181   46   6.4   -4.4   7.8

WIND SPEED

44616       58.2  -10.6  ALL   SPEED  SUR    60     0    0   3.4  -10.3  10.9
44728       59.9   -5.5  ALL   SPEED  SUR   154     0    0   2.3   -5.7   6.1
44769       54.2  -35.6  ALL   SPEED  SUR   132     0    0   4.4   -7.7   8.9
44771       52.1  -35.2  ALL   SPEED  SUR   238     1    0   4.4   -8.7   9.8
62696       59.3  -21.3  ALL   SPEED  SUR   184     0    0   4.0  -11.4  12.1

WIND DIRECTION

44616       58.2  -10.6  ALL   DIRN.  SUR    54     0    0  93.1   63.1 112.4
44769       54.2  -35.6  ALL   DIRN.  SUR    71     0    0  90.8   22.6  93.5
44771       52.1  -35.2  ALL   DIRN.  SUR   191     1    1 100.6   42.3 109.1
62696       59.3  -21.3  ALL   DIRN.  SUR   180     0    0  47.0   64.1  79.5
```

AVAILABILITY - DRIBU - MARCH 1994
MAIN HOURS ONLY
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 3273

FIGURE 2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17 0 26 27 2 20 8 0 3 4 5 4 51 145 81 0 0 5 12 17 14
13 10 5 12 10 18 6 16 13 11 28 23 48 40 8 0 8 3 36 38 10 6 8
2 1 5 0 3 2 2 0 0 3 0 0 3 0 5 7 34 8 8 8 18 5
2 1 7 0 1 0 0 1 0 8 4 11 5 10 5
6 2 7 9 1 8 4 0 9 1 0 5 4
5 5 6 6 13 12 8 3 3 0 7 0 0 0 1 7 17 2 11 7
4 6 5 2 2 13 13 36 21 2 0 0 0 1 0 3 0 1
8 0 18 10 18 20 22 3 8 23 24 9 1 4 4 5 3 38 8 17 58 6
14 33 23 26 10 10 0 7 1 8 2 2 6 26 3
0 3 6 2 28 17 21 0 1 1 5 12 10
13 21 6 17 2 21 20 1 0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for synops & autosynops.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).

Parameters monitored :HT(m) :Station height (in metres) as given in WMO No. 9 Vol A

:RP :Pressure reporting practice
M=mean sea level pressure (hPa) reported.
S=Station level pressure reported.
8=Geopotential height (m) of 850 hPa surface reported.
7=Geopotential height (m) of 700 hPa surface reported.

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)

SELECTION CRITERIA :NOBS ≥ 20 ,and one or more of the following:

1.|bias| ≥ 4 hPa
2. SD ≥ 6 hPa
3.PGE ≥ 25.

Note:- For stn ht ≥ 500 m, mslp is that calculated from station level pressure where available.
For stn ht < 500 m, mslp is that as reported by the station where available.

SUSPECT SYNOPS (PRESSURE) BY WMO REGION MAR 1994

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	120	1	1	88	1.1	4.8	4.9
60468	35.6N	6.2E	1052	S8	121	121	100	21	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	119	119	100	99	0.0	0.0	0.0
60571	31.6N	2.2W	773	S8	121	4	3	21	1.8	-4.4	4.8
60670	24.6N	9.5E	1054	S8	117	0	0	99	1.2	8.6	8.7
61731	13.3N	14.2W	4	M	30	1	3	97	0.8	-4.6	4.7
63333	11.1N	39.7E	1916	MS	46	1	2	89	1.2	7.5	7.6
63402	7.7N	36.8E	1577	MS	74	37	50	97	0.8	-13.8	13.8
63453	8.8N	39.8E	1062	S	54	2	4	98	1.4	12.3	12.4
63474	7.1N	40.0E	2450	S	47	47	100	0	0.0	0.0	0.0
63478	5.1N	44.6E	320	MS	47	0	0	19	1.2	5.8	5.9
64503	3.4S	10.7E	34	M	69	0	0	70	1.7	-5.8	6.0
64507	2.9S	11.0E	79	M	84	1	1	92	1.7	-7.0	7.2
64911	5.0N	9.9E	821	8	84	1	1	26	1.6	-4.6	4.9
67022	14.7S	49.6E	474	MS	40	40	100	3	0.0	0.0	0.0
68014	19.6S	18.1E	1411	S8	87	0	0	70	1.2	-5.5	5.6
68396	26.5S	31.3E	641	S8	53	0	0	38	1.0	4.0	4.1
68752	32.8S	27.4E	524	S8	84	0	0	100	1.0	-7.9	8.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24671	63.9N	135.9E	400	MS	117	6	5	91	2.8	8.7	9.1
25902	60.8N	151.8E	797	MS	57	34	60	98	0.8	-13.9	13.9
29999	52.5N	99.8E	1570	S8	111	109	98	89	0.4	13.6	13.6
30469	55.1N	116.8E	613	M	59	1	2	68	2.6	-5.6	6.2
30554	54.5N	113.6E	995	MS	62	2	3	98	2.1	10.4	10.6
30741	52.9N	110.5E	1255	S8	117	3	3	40	2.2	-5.5	5.9
36729	46.2N	80.9E	397	MS	116	0	0	0	1.9	4.1	4.5
38609	40.1N	70.6E	832	MS	61	1	2	85	1.4	-4.0	4.2
38696	39.6N	66.9E	675	M	57	0	0	93	1.0	-5.0	5.1
38836	38.6N	68.8E	824	M	51	1	2	0	1.6	4.7	5.0
40356	31.7N	38.7E	818	S8	119	0	0	76	1.0	-5.0	5.1
40376	27.6N	38.6E	860	MS	54	54	100	0	0.0	0.0	0.0
40432	25.8N	42.0E	783	MS	54	54	100	0	0.0	0.0	0.0
40450	23.7N	44.6E	1080	MS	57	57	100	0	0.0	0.0	0.0
40701	39.3N	44.4E	1470	M8	66	0	0	97	1.2	7.9	8.0
40723	37.5N	57.3E	1074	M8	98	5	5	22	1.8	-4.1	4.5
40726	36.8N	45.7E	1385	M8	79	0	0	78	1.3	5.0	5.2
40743	36.2N	57.7E	941	M8	109	2	2	32	1.9	-5.1	5.4
40762	35.3N	59.2E	1333	M8	106	26	25	98	1.9	-13.2	13.3
40763	35.2N	58.5E	1060	M8	43	2	5	19	1.5	-5.8	6.0
40783	32.4N	49.7E	1972	M8	35	2	6	89	1.4	-6.8	6.9
40789	33.8N	55.1E	921	M8	50	3	6	92	3.9	6.8	7.8
40818	31.2N	52.7E	2004	M8	82	1	1	30	1.4	-4.1	4.3
40836	30.8N	51.7E	1880	M8	69	1	1	99	1.3	7.9	8.0
41035	21.3N	40.3E	2089	S7	36	36	100	0	0.0	0.0	0.0
41254	23.1N	57.7E	1755	S	78	78	100	74	0.0	0.0	0.0
41396	16.0N	48.9E	700	M	25	1	4	72	3.0	6.5	7.2
41466	13.7N	44.1E	1385	8	27	0	0	93	1.7	-6.3	6.5
44232	49.4N	102.7E	933	MS	91	6	7	14	2.4	-4.2	4.8
44241	48.9N	106.1E	807	MS	58	5	9	97	1.6	-10.8	10.9
44277	46.4N	96.3E	2147	MS	101	1	1	0	1.8	-6.1	6.4
44292	47.9N	107.0E	1338	MS	102	0	0	0	1.3	4.6	4.8
44416	28.6N	81.6E	720	MS	73	3	4	0	2.6	5.3	5.9
44477	27.0N	87.4E	1445	S8	69	69	100	100	0.0	0.0	0.0

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
47022	40.8N	128.2E	1206	S	117	1	1	34	1.9	4.4	4.8
51334	44.6N	82.9E	321	M	118	14	12	0	3.6	7.1	8.0
51467	42.7N	86.3E	1753	S	123	1	1	0	1.9	6.1	6.4
52602	38.8N	93.4E	2734	S	122	0	0	0	2.1	-6.5	6.8
52866	36.7N	101.8E	2296	S	123	0	0	26	1.8	4.9	5.2
56021	34.1N	95.8E	4176	S	120	0	0	2	1.7	-4.0	4.3
56144	31.7N	98.6E	3204	S	112	0	0	38	2.3	-4.9	5.4
56287	30.0N	103.0E	629	M	122	0	0	57	2.4	6.7	7.1
56385	29.5N	103.3E	3049	S	117	0	0	0	2.2	-4.0	4.6
56444	28.5N	98.9E	3488	S	107	107	100	100	0.0	0.0	0.0
56462	29.0N	101.5E	2994	S	114	0	0	0	2.9	6.2	6.8
57622	28.9N	107.2E	1907	S	113	12	11	0	1.7	-12.0	12.1
57816	26.5N	106.7E	1222	MS	122	117	96	100	0.9	13.9	13.9

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	S	41	0	0	49	2.0	-4.8	5.2
82336	3.1S	58.4W	48	MS	67	0	0	64	3.1	6.0	6.8
83235	12.3S	46.4W	660	MS	27	0	0	70	1.2	6.1	6.2
83295	13.4S	39.9W	755	S	24	0	0	79	0.8	-4.2	4.3
83332	14.1S	46.4W	950	MS	73	24	33	100	0.9	13.6	13.6
83423	16.7S	49.3W	729	MS	75	0	0	44	1.4	-4.8	5.0
83488	17.8S	42.9W	1097	MS	69	69	100	97	0.0	0.0	0.0
83531	18.6S	46.5W	896	MS	71	0	0	90	1.2	-6.2	6.3
83587	19.8S	43.9W	850	MS	79	0	0	0	1.8	-7.1	7.3
83689	21.3S	43.8W	1171	MS	22	0	0	100	1.3	5.5	5.7
83704	22.3S	53.9W	369	MS	71	0	0	70	4.3	-7.4	8.6
83953	30.9S	55.5W	231	M	21	0	0	52	4.0	-4.8	6.2
84377	3.8S	73.3W	126	MS	119	0	0	0	2.2	4.4	4.9
84401	5.2S	80.6W	50	MS	102	0	0	0	1.9	4.7	5.1
84425	5.9S	76.1W	184	MS	52	1	2	0	2.5	6.3	6.8
84472	7.1S	78.5W	2622	S	61	2	3	92	1.7	-7.9	8.1
84531	9.2S	78.5W	21	MS	67	0	0	0	1.1	4.0	4.1
84658	12.6S	69.2W	266	MS	63	1	2	0	2.9	7.0	7.6
84686	13.6S	72.0W	3249	S	110	3	3	6	2.2	-4.4	4.9
84782	18.1S	70.3W	469	MS	106	0	0	0	1.8	4.3	4.7
85201	16.5S	68.2W	4071	S	118	0	0	0	1.8	4.7	5.0
85230	17.6S	69.4W	4057	S	28	0	0	0	1.0	4.2	4.3
85406	18.3S	70.3W	58	M	102	0	0	0	1.9	4.7	5.1
87046	24.4S	65.1W	905	S8	105	104	99	0	0.0	1.9	1.9
87322	31.3S	66.6W	658	S	82	82	100	0	0.0	0.0	0.0

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
70251	62.3N	150.1W	109	MS	35	0	0	6	2.8	4.2	5.0
71137	49.1N	107.6W	785	MS	23	0	0	70	3.9	-7.9	8.8
71465	42.9N	81.9E	178	MS	119	34	29	67	7.0	-2.9	7.6
71917	80.0N	85.9W	10	MS	121	2	2	13	4.0	5.5	6.8
76118	30.4N	109.7W	1040	MS	39	1	3	97	1.4	-10.3	10.4
76373	25.3N	105.8W	1967	MS	73	69	95	99	0.6	14.0	14.0
76539	22.1N	101.0W	1871	MS	95	0	0	86	1.0	-5.4	5.5
76632	20.1N	98.7W	2417	MS	68	1	1	99	1.3	-7.6	7.7
76692	19.1N	96.1W	13	MS	82	0	0	6	1.5	4.3	4.6
76726	18.9N	99.3W	1560	MS	85	2	2	99	1.4	-9.3	9.4
76750	18.5N	88.3W	3	MS	103	0	0	21	1.1	-4.2	4.3
76762	17.5N	99.5W	1360	MS	84	2	2	98	1.3	10.7	10.8
76848	16.3N	92.1W	1530	MS	103	26	25	99	0.9	-13.5	13.5

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
78397	18.1N	76.9W	786	MS	106	106	100	0	0.0	0.0	0.0
78501	17.4N	83.9W	11	M	111	83	75	0	11.2	-3.1	11.6
78718	14.4N	87.6W	626	MS	23	23	100	91	0.0	0.0	0.0
78795	8.1N	81.0W	88	MS	67	0	0	31	1.6	4.6	4.9

WMO REGION 5:

NO SUSPECTS IN THIS REGION

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01245	62.6N	9.7E	630	MS	90	0	0	93	1.2	-5.7	5.8
01446	59.6N	8.3E	804	MS	87	2	2	99	1.6	11.3	11.4
04221	69.3N	51.1W	31	MS	119	0	0	8	2.9	4.4	5.3
04231	67.0N	50.8W	53	MS	120	0	0	16	3.1	4.6	5.5
08221	40.5N	3.6W	633	MS	82	0	0	93	1.2	5.8	5.9
11241	47.2N	15.5E	1438	S8	82	40	49	57	4.6	-3.3	5.7
11360	47.5N	14.1E	710	MS	33	0	0	79	1.1	4.0	4.1
15052	47.4N	25.6E	1541	S8	117	0	0	0	1.7	-5.1	5.4
16020	46.5N	11.3E	1461	MS	66	66	100	0	0.0	0.0	0.0
16614	40.4N	21.3E	604	MS	97	2	2	98	1.1	-7.9	8.0
17084	40.6N	35.0E	837	MS	120	0	0	99	1.4	8.0	8.1
17260	37.1N	37.4E	855	MS	117	116	99	99	0.0	14.5	14.5
37228	43.1N	44.6E	670	MS	59	0	0	81	2.8	-4.1	5.0
40184	31.8N	35.2E	809	S8	123	0	0	98	1.4	6.4	6.6

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89266	72.2S	60.3W	91	MS	39	29	74	97	10.1	-7.6	12.6
89667	78.0S	166.5E	20	MS	89	0	0	3	3.1	4.4	5.4
89757	73.8S	55.7E	2775	S7	77	77	100	88	0.0	0.0	0.0
89803	68.5S	102.2E	2118	S7	81	1	1	54	2.0	-8.4	8.6
89805	74.1S	109.8E	3070	S7	83	23	28	8	3.6	-1.3	3.8
89811	66.7S	112.9E	1362	S8	91	4	4	41	3.2	-7.2	7.9
89828	74.5S	123.0E	3280	S7	88	4	5	31	4.4	4.8	6.5
89832	66.7S	139.8E	240	S	57	57	100	100	0.0	0.0	0.0
89860	74.2S	160.3E	1772	S8	86	3	3	7	2.9	-6.9	7.5
89861	74.5S	160.5E	1525	S8	87	4	5	20	2.6	-8.7	9.1
89868	79.9S	169.8E	60	MS	89	89	100	98	0.0	0.0	0.0

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in $m\ s^{-1}$

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind

SELECTION CRITERIA :N REP ≥ 20

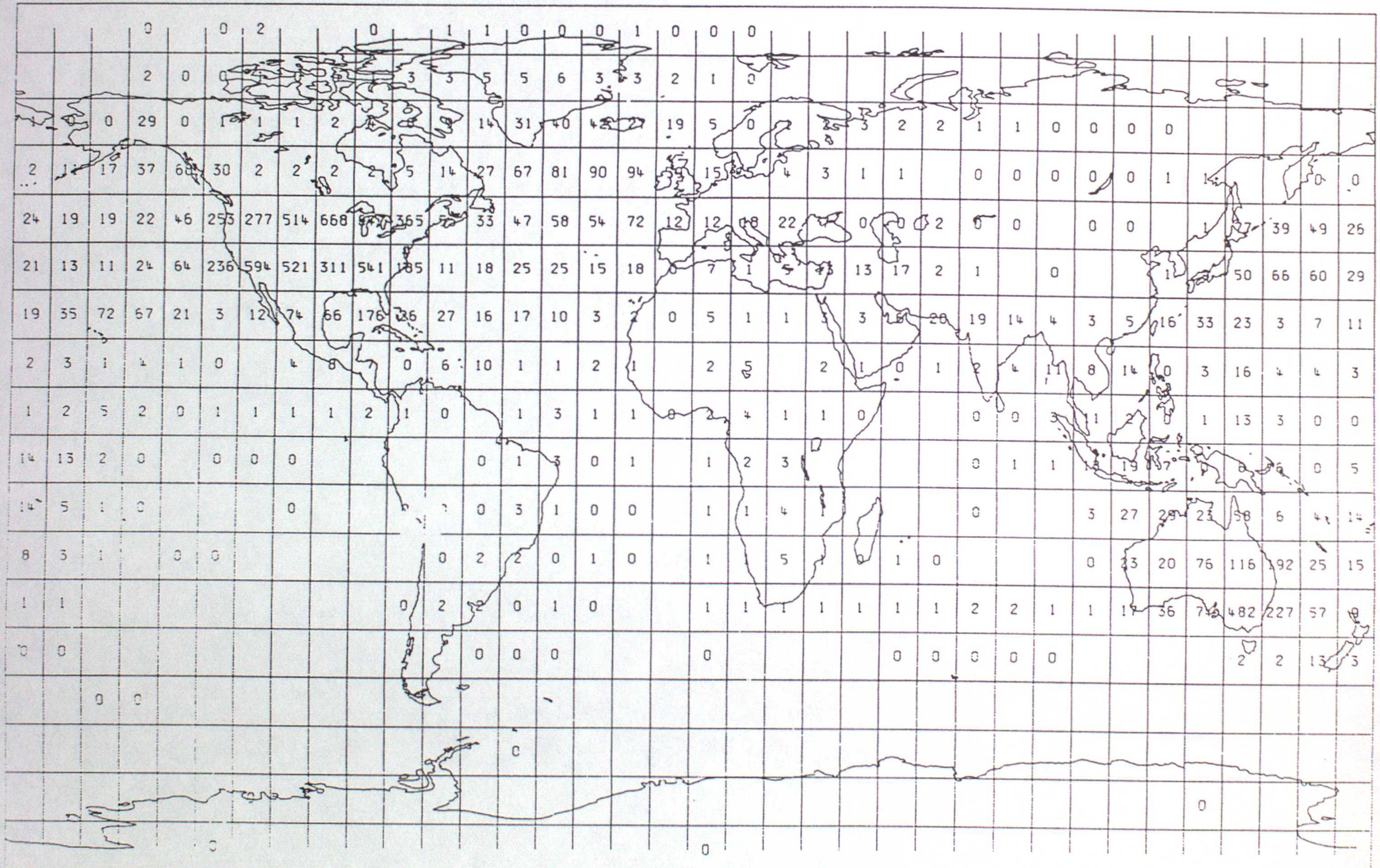
	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	98	1	3	2.4	0.7	98	0	3	1	9.6	-0.4
AAL	2280	0	1	2.0	0.0	2319	0	1	0	8.4	1.4
AAR	966	1	2	2.3	-0.4	967	0	2	0	9.4	1.5
ACA	584	1	1	2.2	-0.7	595	0	1	0	8.1	0.6
ACI	39	3	3	0.9	0.4	38	0	3	3	5.5	1.0
ADV	23	4	4	2.4	1.5	23	0	4	0	13.0	0.4
AEA	95	0	4	2.2	-0.2	92	1	2	0	10.6	1.9
AEL	285	2	5	2.0	-0.4	295	0	5	0	9.5	0.6
AFL	94	7	100	4.9	3.6	95	1	100	0	14.2	0.3
AFR	690	0	5	1.9	0.4	697	0	5	0	8.9	1.3
AJJ	50	2	6	2.3	-0.1	50	0	8	2	11.8	1.8
AMT	60	0	2	1.8	0.6	61	2	2	0	9.4	1.3
AMX	239	1	2	2.4	-0.5	241	0	1	0	9.1	0.2
ANA	583	1	2	2.5	0.5	585	0	3	1	9.1	1.7
ANZ	2445	1	3	1.9	0.0	2446	0	3	1	8.2	1.9
AOM	425	2	3	2.3	0.8	432	0	2	0	8.7	0.7
ARG	23	4	4	1.8	-0.3	23	0	0	0	7.1	-0.2
ARP	259	1	7	1.8	0.1	254	0	7	0	10.3	1.2
ASY	41	0	5	2.7	0.6	41	0	0	0	8.1	2.3
AUA	23	0	17	1.5	0.1	22	0	0	0	8.8	4.0
AVA	283	1	2	2.3	-0.6	283	0	3	0	10.8	1.6
AVN	29	0	0	1.0	0.4	29	0	0	0	4.9	0.5
AVY	46	0	7	2.4	-1.5	45	0	2	2	9.4	1.1
AZA	307	0	2	2.5	1.3	307	0	3	0	9.0	0.8
BAL	72	0	17	2.6	-0.9	76	0	14	1	8.1	1.3
BAW	588	0	6	2.1	0.1	599	0	6	0	8.2	1.0
BBB	22	0	14	1.6	-0.6	22	0	14	0	9.8	2.7
BWA	358	1	1	1.8	0.5	364	0	2	0	9.2	1.8
CAL	1285	0	2	2.3	-0.2	1292	0	2	0	9.6	1.5
CCA	177	1	95	2.6	0.0	177	1	8	1	11.8	1.5
CDN	1566	1	3	2.2	0.4	1570	0	3	0	8.8	1.4
CES	154	1	3	2.4	0.4	154	0	2	0	10.8	0.8
CFG	539	1	74	2.3	-1.2	537	0	4	0	9.6	1.0
CKS	70	0	100	3.9	-1.0	72	0	100	0	18.0	1.8
CLX	47	0	6	2.0	-0.3	48	0	6	0	11.2	2.5
CMI	1026	1	3	2.2	0.5	1036	0	3	0	9.8	1.0
CMM	142	0	0	2.2	-0.6	143	0	2	0	10.7	2.0
COA	400	1	2	1.8	0.1	407	0	1	0	8.7	0.7
CPA	195	0	2	2.1	-0.2	195	0	3	0	8.8	2.2
CRL	189	2	2	1.3	-0.3	190	0	3	1	9.5	2.3
CTM	30	0	53	3.0	0.3	28	0	7	0	9.7	0.0
CUB	141	7	45	3.2	1.3	141	0	9	1	10.9	0.7
DAL	3084	1	2	2.3	0.5	2984	0	2	0	8.9	1.4
DHL	86	1	8	3.7	-0.3	86	0	70	0	11.9	1.2
DLH	2496	0	6	1.9	-0.2	2507	0	8	2	8.1	1.2
DOA	71	0	8	1.9	-0.4	75	0	9	0	9.2	0.6
EIA	197	2	9	2.8	0.1	210	0	7	0	12.0	1.8
ELY	94	1	7	1.7	-0.5	97	0	10	0	7.6	0.3
EVA	847	1	2	2.3	-0.2	849	0	2	0	10.2	1.3
FDX	719	0	1	2.2	0.7	729	0	1	0	8.8	1.1
FIN	238	2	3	2.0	0.6	239	0	3	1	9.8	0.5
FJI	335	2	4	1.4	0.3	333	0	2	0	7.9	0.9
FMN	34	3	3	1.9	0.8	34	0	0	0	7.2	2.0
GAF	38	3	5	2.7	-0.8	38	0	5	3	7.9	1.2
GIA	231	3	4	2.0	0.2	230	0	1	1	6.6	1.5
HAL	747	1	4	2.6	1.2	755	0	4	1	10.6	1.9
HLF	119	1	69	2.3	-1.0	114	0	2	0	10.3	1.1
HZM	26	0	4	2.0	1.0	26	0	4	0	10.3	-0.7
IBE	1134	1	12	1.8	0.2	1119	0	13	0	9.9	0.9

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

FIGURE 3

MARCH 1994

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED



		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
ICE	275	1	1	2.2	-0.2	276	0	1	0	9.1	1.5
JAA	60	7	8	2.4	-0.1	61	0	0	0	11.7	4.4
JAL	3616	0	1	2.2	0.2	3621	0	2	0	9.7	1.1
JAS	76	0	1	1.7	0.3	77	0	1	0	9.2	-0.4
JAZ	119	0	56	2.6	1.1	119	0	2	0	10.1	1.3
KAL	2153	1	2	2.4	0.0	2149	0	2	0	9.5	1.2
KLM	1058	0	2	1.9	0.2	1070	0	2	0	8.3	1.1
LDA	148	1	60	2.2	-1.1	149	0	9	0	9.1	0.1
LDI	163	1	74	2.3	-1.6	166	0	4	0	10.1	1.0
LIB	131	1	1	1.7	-0.3	133	0	2	0	8.9	0.4
LOT	198	0	1	2.3	0.4	200	0	2	1	8.5	1.2
LTU	522	1	2	1.9	0.2	502	0	2	0	9.2	1.3
LWD	38	3	3	1.8	-0.3	46	2	4	0	8.9	-0.2
MAH	59	0	2	2.2	-0.6	61	0	2	0	6.2	0.1
MAS	233	0	1	2.1	-0.3	234	0	3	1	9.4	1.6
MDA	87	0	63	2.7	1.1	87	0	1	1	7.8	0.7
MPH	242	0	1	1.7	0.0	239	0	3	0	9.1	1.1
MRS	23	4	4	1.3	0.0	23	0	4	0	16.0	2.2
NAL	102	0	65	2.4	1.4	101	0	4	2	9.9	0.1
NCA	501	0	1	2.2	0.2	501	0	1	1	8.4	0.9
NGA	62	2	2	1.6	0.0	62	0	3	0	10.3	1.2
NWA	7727	1	2	2.4	0.5	7739	0	2	0	9.4	1.4
PAL	766	2	4	2.5	-0.3	768	0	2	1	10.2	0.6
PAO	242	1	2	1.6	0.6	242	0	2	0	8.1	1.3
QFA	1459	1	2	1.9	0.2	1456	0	4	3	7.3	1.3
RAF	170	1	3	2.3	0.8	169	0	4	1	9.6	2.4
RKA	27	0	7	2.8	-0.1	27	0	0	0	10.1	2.7
RON	53	2	2	1.6	0.9	54	0	0	0	6.5	0.2
RRR	195	1	19	2.6	-0.2	195	0	22	2	9.2	2.0
SAA	190	1	2	2.1	-0.7	190	1	2	0	9.3	1.9
SAS	1299	0	1	1.8	0.2	1303	0	2	1	7.6	0.4
SIA	849	1	2	2.4	-0.5	852	0	3	1	9.4	1.3
SJM	39	8	3	2.0	1.0	42	0	2	0	7.6	1.0
SOL	26	4	8	1.4	0.6	24	0	4	0	9.7	1.4
SPP	121	0	2	1.8	-0.5	114	0	3	0	8.8	0.8
SVA	67	0	0	1.5	0.4	68	0	3	0	9.6	2.1
SWR	230	1	5	1.7	0.1	228	0	5	0	9.2	1.8
TAP	394	1	2	2.0	-0.6	392	0	3	0	9.5	1.7
THA	204	1	2	2.1	-0.6	204	0	3	1	9.0	1.2
TOW	60	2	0	2.0	0.3	62	0	2	0	8.8	3.1
TWA	767	0	2	2.2	0.5	776	0	2	0	9.4	1.0
UAL	83539	1	3	1.8	0.0	83538	0	4	0	7.8	1.1
ULE	71	0	0	1.6	0.2	73	0	0	0	7.9	2.4
UPS	542	3	12	2.2	-0.5	553	0	11	0	9.9	1.1
VIA	358	1	4	1.8	0.0	360	0	6	1	9.5	2.0
VSP	82	0	1	2.3	0.6	82	0	6	0	11.7	-0.3
WOA	33	0	12	1.7	-0.5	33	0	12	0	9.9	4.1
AN	26177	0	1	1.4	0.3	25943	0	1	0	6.6	1.6
BA	10137	0	7	2.0	0.6	10115	0	7	0	8.1	1.5
DL	563	3	99	3.5	0.2	563	68	99	0	47.6	1.0
FJ	23	0	4	2.8	1.4	23	0	0	0	8.6	0.7
KL	4049	0	59	2.2	1.3	4038	0	7	0	7.5	1.3
LH	350	1	5	2.3	-0.5	348	0	4	2	8.6	1.5
NW	48181	0	2	1.9	0.2	48118	0	1	0	7.1	1.1
QF	11340	0	1	1.4	0.3	11309	0	1	0	6.5	1.2
M	195	7	48	3.3	1.2	211	0	11	0	12.5	2.4
N	332	3	5	2.7	0.0	348	0	2	0	10.8	1.6

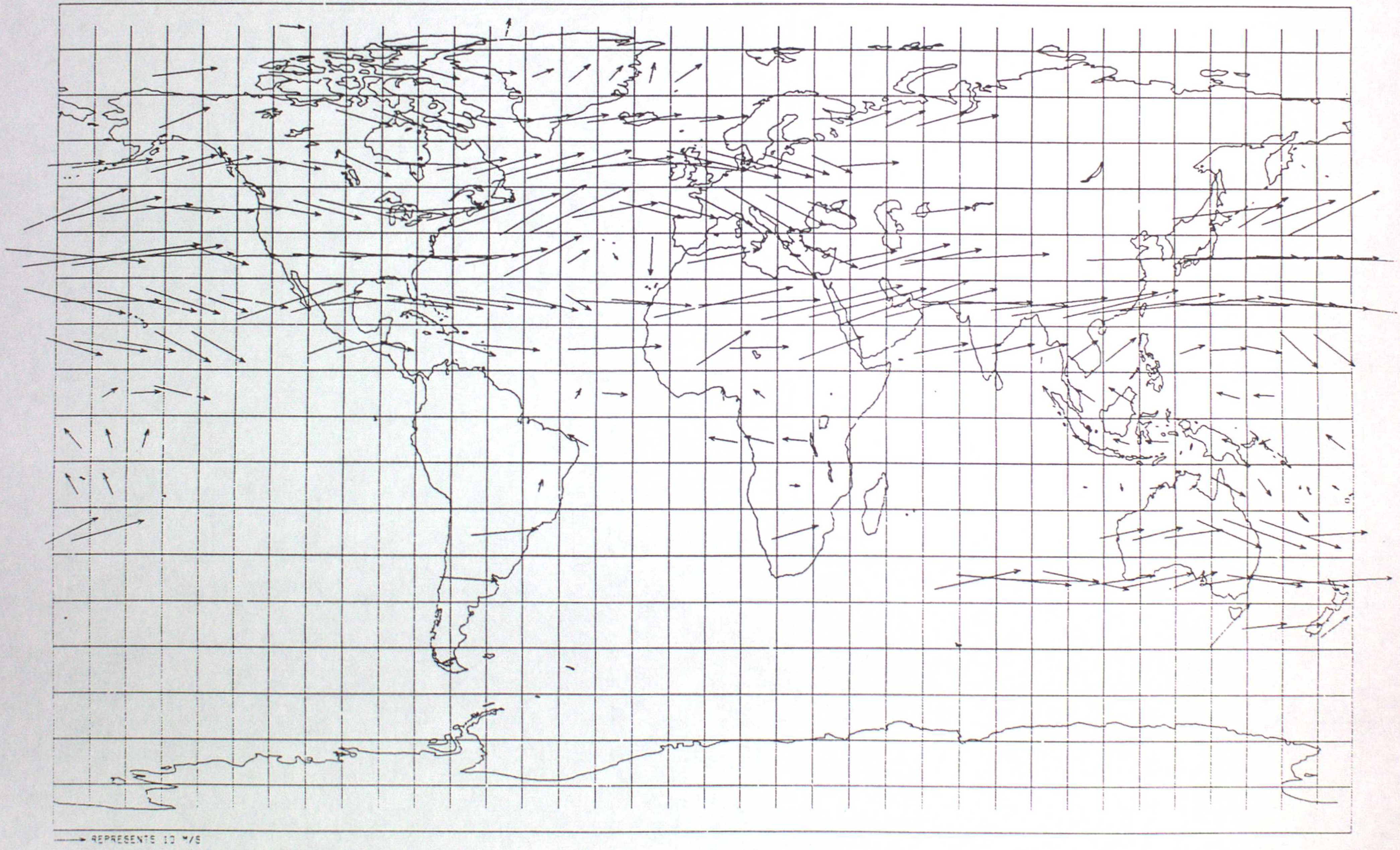
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

MARCH 1994

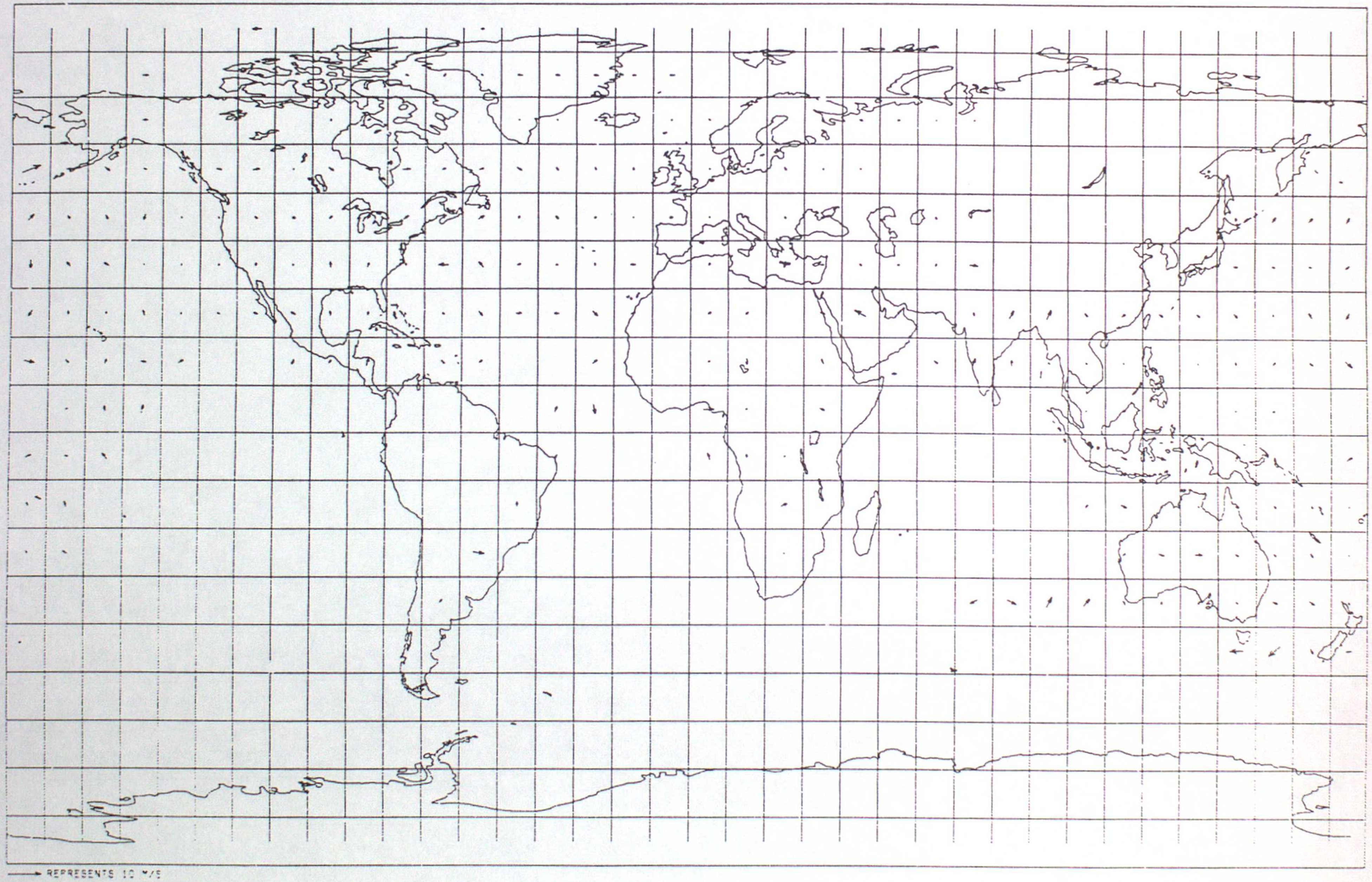
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

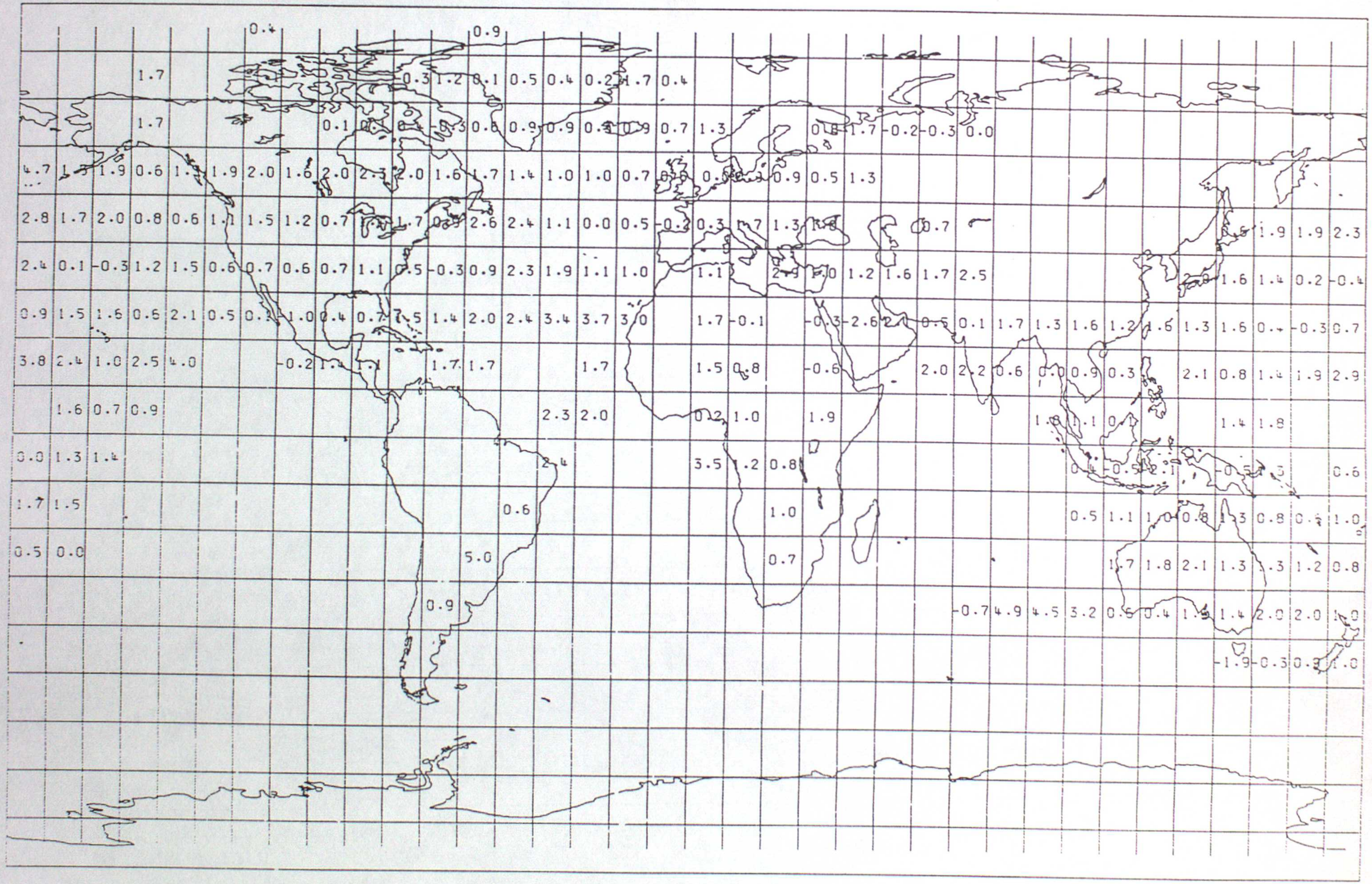


AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA
MARCH 1994
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

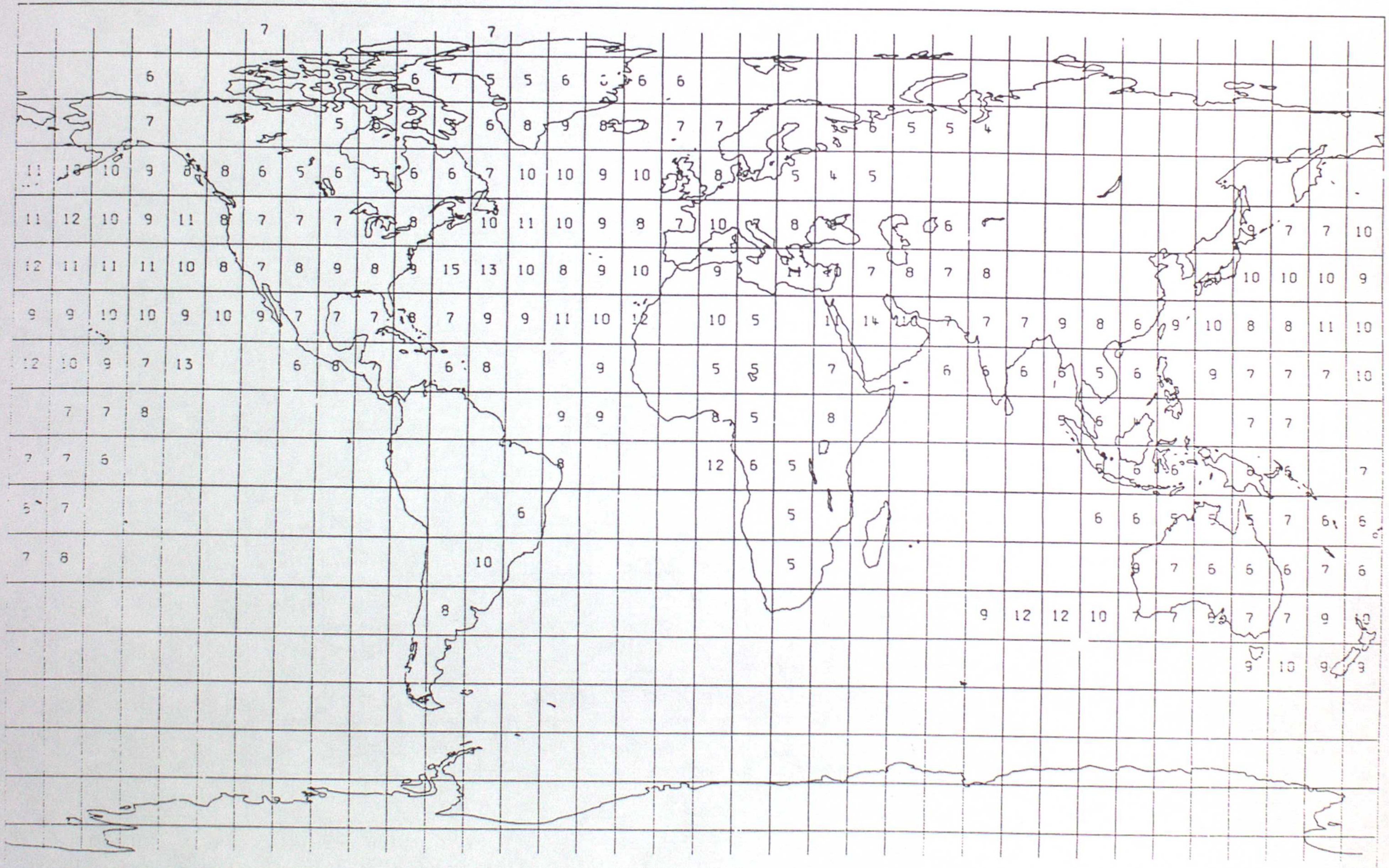
FIGURE 5



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
MARCH 1994
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT


0.4
0.9
1.7 -0.3 1.2 0.1 0.5 0.4 0.2 1.7 0.4
1.7 0.1 0.1 0.4 -0.3 0.8 0.9 0.9 0.3 0.9 0.7 1.3 0.8 1.7 -0.2 -0.3 0.0
4.7 1.3 1.9 0.6 1.3 1.9 2.0 1.6 2.0 2.3 2.0 1.6 1.7 1.4 1.0 1.0 0.7 0.6 0.5 2.3 0.9 0.5 1.3
2.8 1.7 2.0 0.8 0.6 1.1 1.5 1.2 0.7 1.2 1.7 0.9 2.6 2.4 1.1 0.0 0.5 -0.2 0.3 1.7 1.3 1.8 0.7 1.6 1.9 1.9 2.3
2.4 0.1 -0.3 1.2 1.5 0.6 0.7 0.6 0.7 1.1 0.5 -0.3 0.9 2.3 1.9 1.1 1.0 1.1 2.9 1.0 1.2 1.6 1.7 2.5 2.0 1.6 1.4 0.2 -0.4
0.9 1.5 1.6 0.6 2.1 0.5 0.1 1.0 0.4 0.7 7.5 1.4 2.0 2.4 3.4 3.7 3.0 1.7 -0.1 -0.3 -2.6 2.1 0.5 0.1 1.7 1.3 1.6 1.2 1.6 1.3 1.6 0.4 -0.3 0.7
3.8 2.4 1.0 2.5 4.0 -0.2 1.4 1.1 1.7 1.7 1.7 1.5 0.8 -0.6 2.0 2.2 0.6 0.0 0.9 0.3 2.1 0.8 1.4 1.9 2.9
1.6 0.7 0.9 2.3 2.0 0.2 1.0 1.9 1.8 1.1 0.4 1.4 1.8
0.0 1.3 1.4 2.4 3.5 1.2 0.8 0.4 -0.5 2.1 -0.5 1.3 0.6
1.7 1.5 0.6 1.0 0.5 1.1 1.0 0.8 1.3 0.8 0.4 1.0
0.5 0.0 5.0 0.7 1.7 1.8 2.1 1.3 1.3 1.2 0.8
0.9 -0.7 4.9 4.5 3.2 0.5 0.4 1.5 1.4 2.0 2.0 1.0
-1.9 -0.3 0.3 1.0

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
MARCH 1994
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT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7 5 6 6 5 6 8 9 8 7 7 6 5 5 4
11 13 10 9 8 8 6 5 6 5 6 6 7 10 10 9 10 10 8 8 5 4 5
11 12 10 9 11 8 7 7 7 8 10 11 10 9 8 7 10 7 8 6 9 7 7 10
12 11 11 11 10 8 7 8 9 8 9 15 13 10 8 9 10 9 11 10 7 8 7 8 10 10 10 9
9 9 10 10 9 10 9 7 7 7 8 7 9 9 11 10 12 10 5 11 14 10 7 7 7 9 8 6 9 10 8 8 11 10
12 10 9 7 13 6 8 6 8 9 5 5 7 6 6 6 6 5 6 9 7 7 7 10
7 7 8 9 9 8 5 8 5 6 7 7
7 7 6 8 12 6 5 6 6 6 7
6 7 6 5 6 6 5 5 5 7 6 6
7 6 10 5 9 7 6 6 6 7 6
8 9 12 12 10 7 7 9 7 7 9 10
9 10 9 9

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

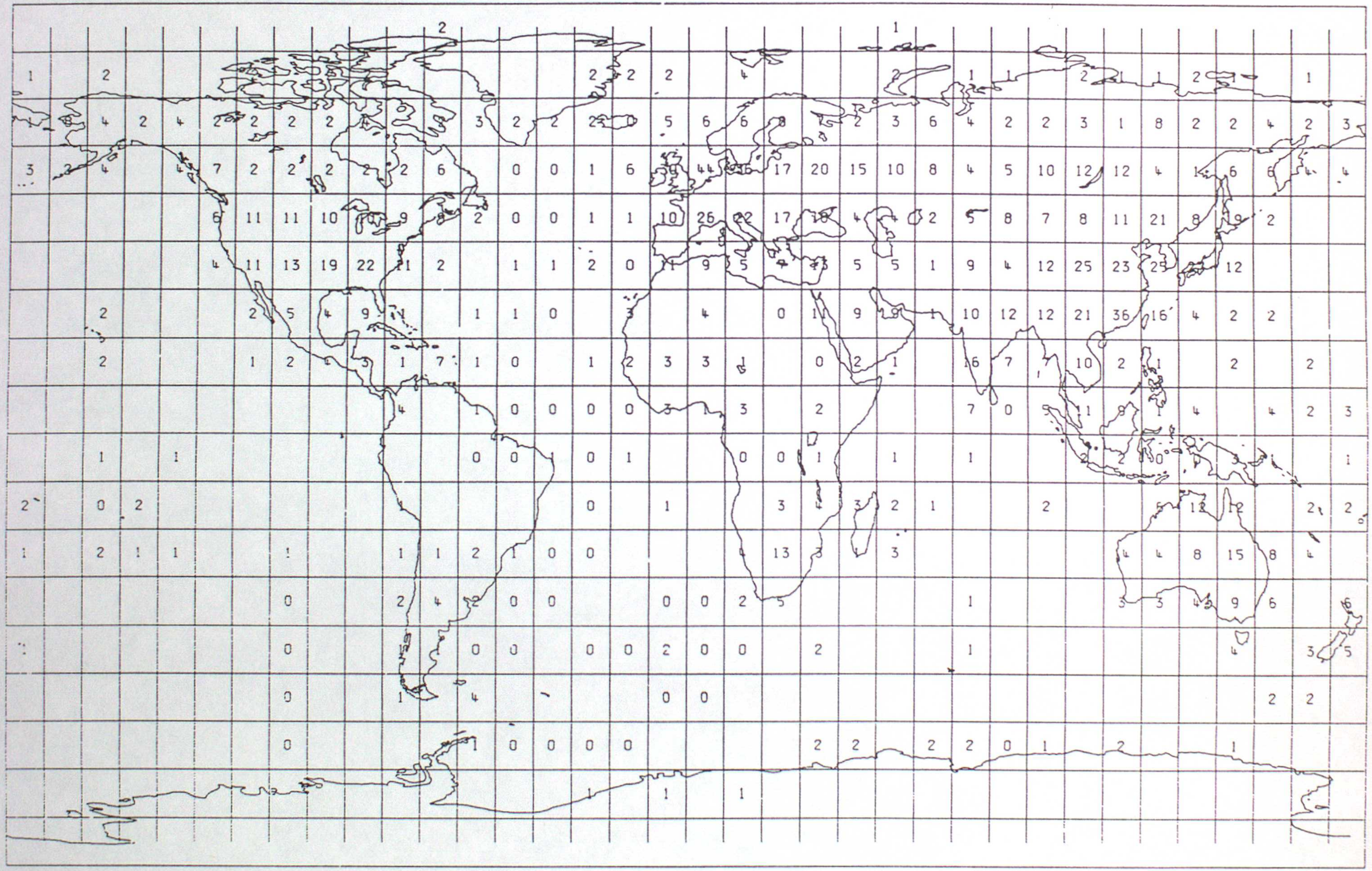
SELECTION CRITERIA :≥ 3 levels with ≥ 10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
41594	00	Z	400	32/ 73	11	0	63.5	-65.1	91.0	4
41977	00	Z	250	22/ 92	24	0	70.2	4.5	70.4	4
42027	00	Z	400	34/ 75	13	0	68.1	-4.8	68.3	4
42027	12	Z	150	34/ 75	10	2	57.5	143.9	155.0	6
42182	00	Z	50	29/ 77	20	0	170.2	51.6	177.9	7
42182	12	Z	30	29/ 77	12	2	194.2	239.5	308.3	7
42314	12	Z	150	27/ 95	11	0	97.2	-123.0	156.8	6
42339	00	Z	200	26/ 73	20	1	88.6	33.6	94.8	4
42339	12	Z	200	26/ 73	20	0	106.3	36.3	112.3	6
42361	00	Z	150	26/ 78	14	1	106.6	22.2	108.8	6
42361	12	Z	150	26/ 78	17	1	107.7	23.7	110.3	8
42369	00	Z	200	27/ 81	20	1	91.5	97.4	133.6	4
42369	12	Z	200	27/ 81	16	0	76.8	85.4	114.9	5
42379	00	Z	100	27/ 83	17	0	181.0	-1.5	181.0	11
42379	12	Z	150	27/ 83	10	0	116.0	-5.9	116.2	4
42410	00	Z	70	26/ 92	16	0	167.2	155.4	228.3	8
42410	12	Z	100	26/ 92	23	1	121.1	18.5	122.5	7
42492	00	Z	200	26/ 85	20	0	89.7	53.1	104.3	6
42647	00	Z	200	23/ 73	20	1	67.3	-69.3	96.6	4
42701	00	Z	50	23/ 85	9	1	187.2	122.6	223.8	6
42809	00	Z	30	23/ 88	18	4	206.2	159.0	260.4	7
42809	12	Z	100	23/ 88	19	1	153.0	15.7	153.9	8
42867	00	Z	30	21/ 79	17	1	197.7	111.5	227.0	5
42867	12	Z	50	21/ 79	11	1	195.9	58.4	204.4	9
42875	00	Z	30	21/ 82	10	0	147.5	180.8	233.3	5
42971	00	Z	70	20/ 86	19	3	170.4	65.4	182.5	8
42971	12	Z	30	20/ 86	10	0	215.7	143.7	259.2	6
43003	00	Z	70	19/ 73	17	3	187.6	-99.2	212.3	8
43003	12	Z	70	19/ 73	14	1	200.7	26.1	202.4	8
43014	00	Z	50	20/ 75	12	1	259.9	72.9	269.9	10
43014	12	Z	70	20/ 75	10	2	155.4	212.1	263.0	8
43041	00	Z	200	19/ 82	12	0	105.9	10.3	106.4	5
43128	00	Z	150	17/ 78	21	3	106.9	-41.5	114.7	8
43128	12	Z	70	17/ 78	17	1	157.0	140.9	210.9	8
43150	12	Z	100	18/ 83	10	0	148.3	17.8	149.4	5
43185	00	Z	50	16/ 81	9	2	170.6	177.1	245.9	7
43185	12	Z	50	16/ 81	12	3	133.8	177.5	222.3	8
43192	00	Z	150	15/ 74	21	1	105.7	-87.2	137.0	5
43192	12	Z	100	15/ 74	11	1	159.4	68.5	173.5	6
43279	00	Z	150	13/ 80	26	0	102.5	-79.6	129.8	7
43279	12	Z	30	13/ 80	12	2	186.3	156.9	243.6	7
43285	00	Z	100	13/ 75	22	1	136.3	-27.4	139.0	6
43285	12	Z	50	13/ 75	12	4	120.3	188.8	223.9	10
43295	00	Z	70	13/ 78	10	2	98.8	144.7	175.2	5
43295	12	Z	100	13/ 78	16	0	72.2	183.7	197.4	6
43311	00	Z	100	11/ 73	13	0	158.5	-10.7	158.9	6
43311	12	Z	150	11/ 73	13	0	132.9	2.8	132.9	4
43333	00	Z	200	12/ 93	22	1	92.5	-8.0	92.9	5
43346	00	Z	70	11/ 80	17	0	181.6	-86.1	200.9	7
43346	12	Z	50	11/ 80	18	0	132.2	126.7	183.1	4
43353	00	Z	100	10/ 76	16	1	149.9	-34.3	153.8	4
43353	12	Z	50	10/ 76	13	0	211.2	79.7	225.8	8
43369	00	Z	70	8/ 73	12	0	208.9	-116.1	239.0	7
43369	12	Z	70	8/ 73	12	1	194.2	29.3	196.4	7
43371	00	Z	70	8/ 77	23	2	125.4	-144.8	191.6	7
43371	12	Z	50	8/ 77	17	1	199.3	37.2	202.7	7
44373	12	Z	200	44/ 104	13	0	65.2	134.5	149.5	5
48820	00	Z	100	21/ 106	26	1	40.8	164.2	169.1	5
48820	12	Z	100	21/ 106	25	0	47.7	189.1	195.0	4
56985	00	Z	100	23/ 103	31	0	40.2	105.9	113.2	4

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
56985	12	Z	100	23/ 103	29	0	31.5	117.3	121.4	5
57679	00	Z	70	28/ 113	24	0	62.1	135.3	148.9	6
57679	12	Z	70	28/ 113	22	0	54.1	128.7	139.6	4
57993	12	Z	100	26/ 115	23	0	38.7	104.7	111.6	4
60360	12	Z	300	37/ 8	1	25	0.0	-185.0	185.0	6
62306	00	Z	70	31/ 27	15	0	83.3	161.8	182.0	4
62306	12	Z	50	31/ 27	2	10	5.0	391.0	391.0	9
62378	12	Z	70	30/ 31	8	2	44.7	289.7	293.2	6
68240	12	Z	100	-24/ 26	14	0	64.3	101.9	120.5	4
70414	00	Z	70	53/ 174	12	0	74.7	186.4	200.8	6
72486	00	Z	30	39/-115	21	0	36.5	217.0	220.0	4
72681	00	Z	30	44/-116	22	1	34.6	222.1	224.8	4
89009	00	Z	300	-90/ 0	19	0	86.3	-7.7	86.6	4
91557	12	Z	200	-18/ 168	25	0	17.9	-216.8	217.5	9
97014	00	Z	100	2/ 125	27	0	72.5	-142.3	159.7	8

AVAILABILITY - TEMP - 500 HPA GEOPOTENTIAL - MARCH 1994 FIGURE 8
ALL HOURS
10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS
TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1546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6 11 11 10 10 9 8 2 0 0 1 1 10 26 22 17 18 4 4 2 5 8 7 8 11 21 8 9 2
4 11 13 19 22 21 2 1 1 2 0 1 9 5 4 3 5 5 1 9 4 12 25 23 25 12
2 2 5 4 9 11 1 1 0 3 4 0 11 9 19 1 10 12 12 21 36 16 4 2 2
2 1 2 3 1 7 1 0 1 2 3 3 1 0 2 1 16 7 7 10 2 1 2 2
4 1 0 0 0 0 3 1 3 2 7 0 5 11 8 1 4 4 2 3
1 1 0 0 1 0 1 0 0 1 1 1 2 0 3 1
2 0 2 0 1 3 4 3 2 1 2 5 12 12 2 2
1 2 1 1 1 1 1 2 1 0 0 4 13 3 1 3 4 4 8 15 8 4
0 2 4 2 0 0 0 0 2 5 1 3 3 4 9 6 6
0 1 0 0 0 0 2 0 0 2 1 4 3 5
0 1 4 0 0 2 2
0 1 0 0 0 0 2 2 2 2 0 1 2 1
1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in $m\ s^{-1}$

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:UBIAS,VBIAS:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA :$\geq$ 10 observations and $\geq$ 15 $m\ s^{-1}$ RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
41530	00	V	150	34/ 72	14	0	7	13.4	7.2	19.6	3
41780	00	V	200	25/ 67	17	0	5	-10.8	-1.5	15.9	1
41977	00	V	200	22/ 92	24	0	33	-26.1	-12.5	24.2	5
42339	00	V	200	26/ 73	15	0	6	-13.5	0.9	16.7	2
42339	12	V	200	26/ 73	14	0	0	-11.0	1.1	15.0	1
42361	00	V	150	26/ 78	12	0	8	2.6	1.4	16.6	1
42361	12	V	200	26/ 78	20	0	15	7.6	-2.5	18.8	2
42369	00	V	200	27/ 81	21	0	4	-12.5	-0.3	16.0	2
42369	12	V	200	27/ 81	16	0	12	-16.0	-1.5	20.4	2
42379	00	V	100	27/ 83	16	1	11	14.5	-7.5	20.7	2
42397	00	V	200	27/ 88	14	0	0	-11.4	1.5	17.0	1
42397	12	V	150	27/ 88	11	0	0	-11.6	3.3	19.3	2
42410	00	V	250	26/ 92	14	0	7	-4.8	6.9	17.9	1
42410	12	V	250	26/ 92	11	0	0	-6.9	3.2	17.2	1
42875	00	V	250	21/ 82	14	0	14	9.2	7.8	19.8	1
56691	00	V	100	27/ 104	25	1	26	12.8	-1.3	15.3	1
58968	12	V	300	25/ 122	31	0	9	4.0	1.4	16.6	2
71701	12	V	300	46/ -66	10	0	10	-0.3	2.5	18.6	1

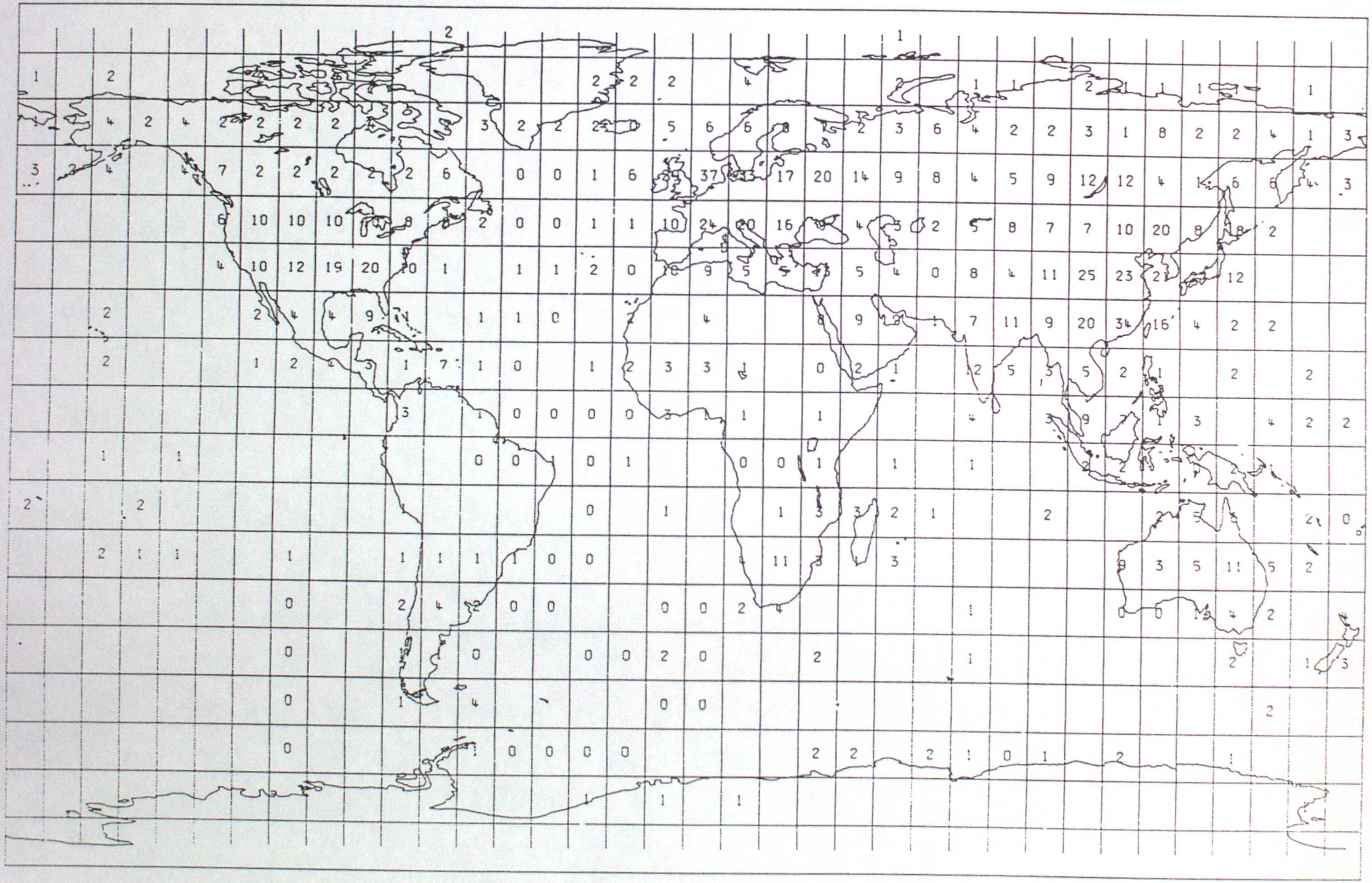
AVAILABILITY - TEMP/PILOT - 300 HPA WIND - MARCH 1994

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1374

FIGURE 9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6 10 10 10 8 2 0 0 1 1 10 24 20 16 4 3 2 5 8 7 7 10 20 8 8 2
4 10 12 19 20 20 1 1 1 2 0 10 9 5 5 3 5 4 0 8 4 11 25 23 21 12
2 2 4 4 9 1 1 1 0 2 4 8 9 3 1 7 11 9 20 34 16 4 2 2
2 1 2 3 1 7 1 0 1 2 3 3 1 0 2 1 2 5 3 5 2 1 2 2
3 1 0 0 0 0 3 1 1 1 4 3 9 1 3 4 2 2
1 1 0 0 1 0 1 0 0 1 1 1 1 2 2
2 2 0 1 1 3 3 2 1 2 2 0
2 1 1 1 1 1 1 1 0 0 4 11 3 1 3 3 3 5 11 5 2
0 2 4 2 0 0 0 0 2 4 1 0 0 1 4 2 4
0 1 0 0 0 2 0 2 1 2 1 3
0 1 4 0 0 2
0 1 0 0 0 0 2 2 2 1 0 1 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS $\geq$ 5, and

ABSOLUTE BIAS $\geq$ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
24641	00	DD	64/ 122	20	11.0	4.0	15.2
24641	12	DD	64/ 122	20	10.9	4.1	13.9
25399	12	DD	66/-170	28	11.5	6.8	15.1
54857	00	DD	36/ 120	28	22.2	3.5	9.8
54857	12	DD	36/ 120	25	18.9	2.8	6.0
58457	00	DD	30/ 120	27	-19.0	2.7	6.0
58457	12	DD	30/ 120	29	-20.1	2.6	7.4
60571	12	DD	32/ -2	28	11.2	7.9	21.0
67083	00	DD	-19/ 47	14	14.9	9.3	26.1

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer:701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

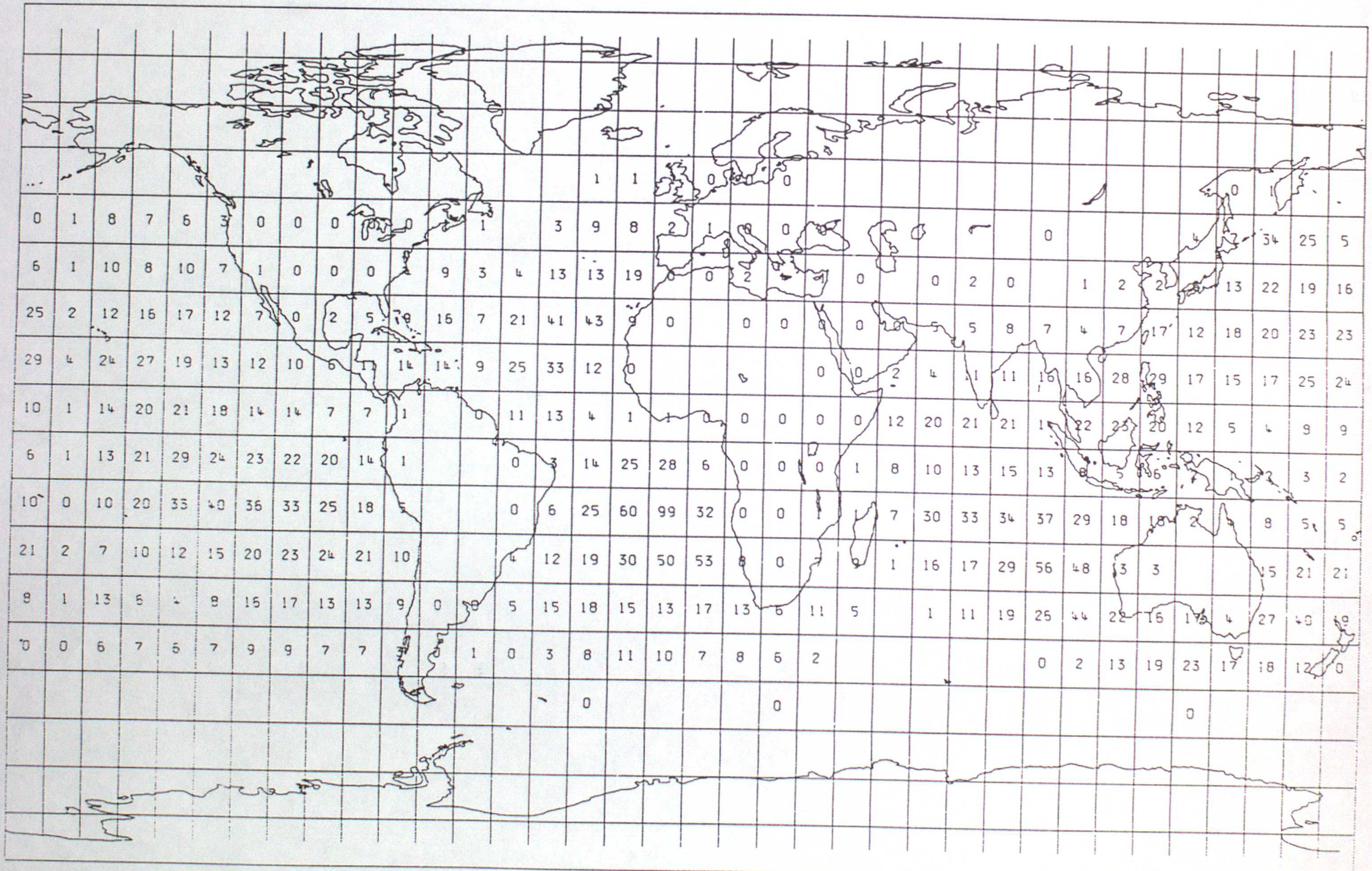
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

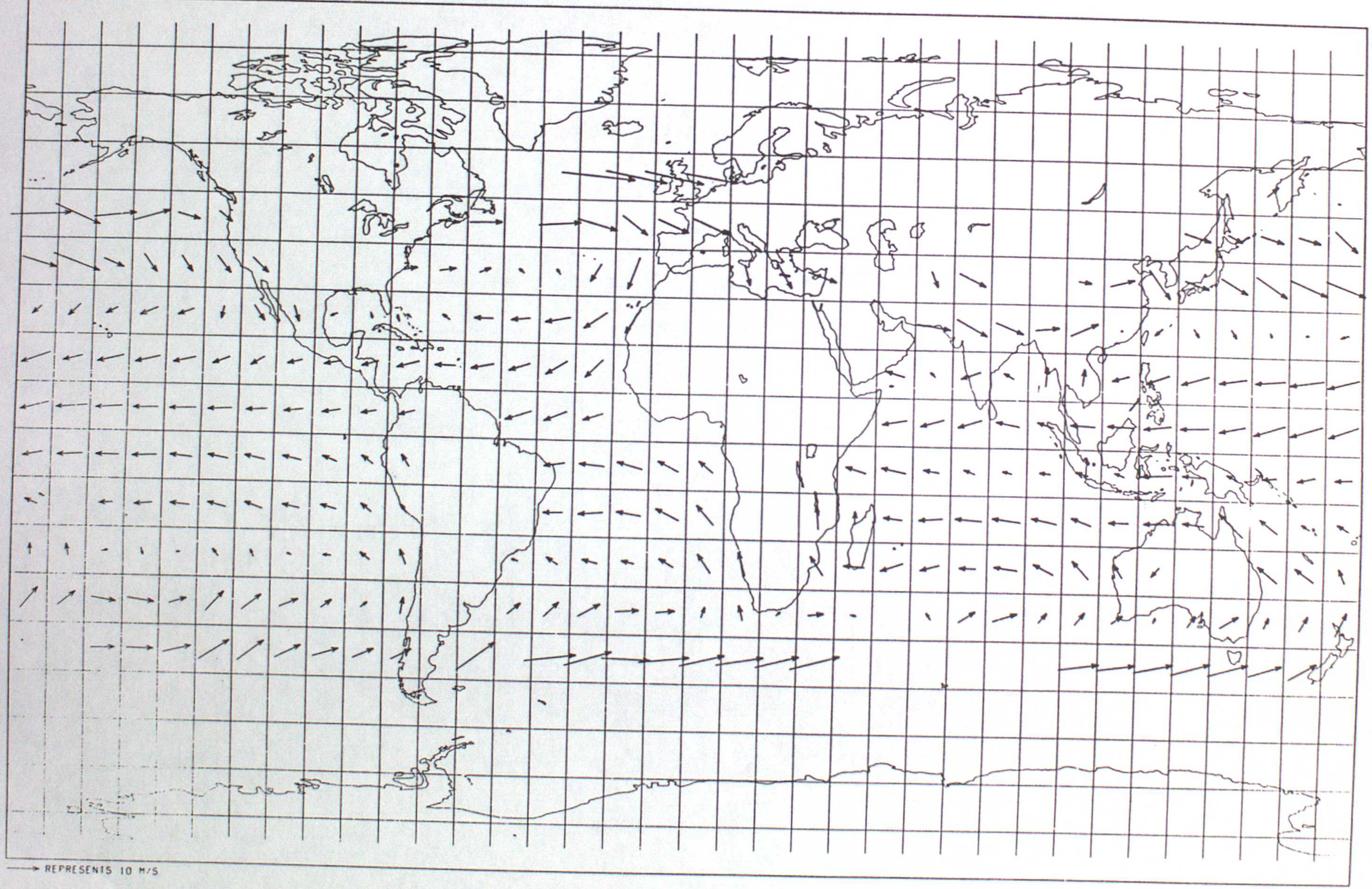
:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
MARCH 1994



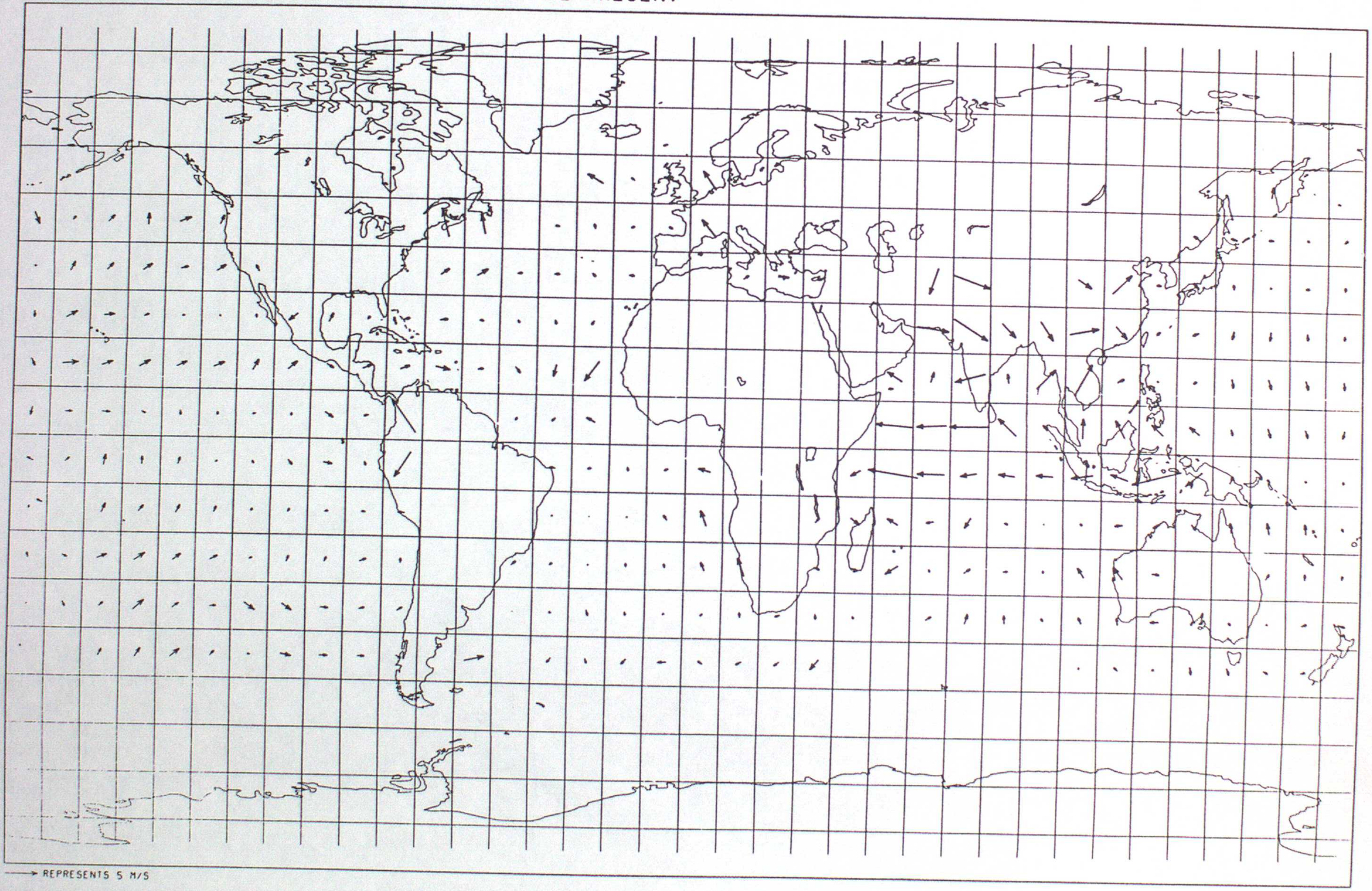
SATOB VECTOR MEAN WINDS BETWEEN 701-1000 HPA
MARCH 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11

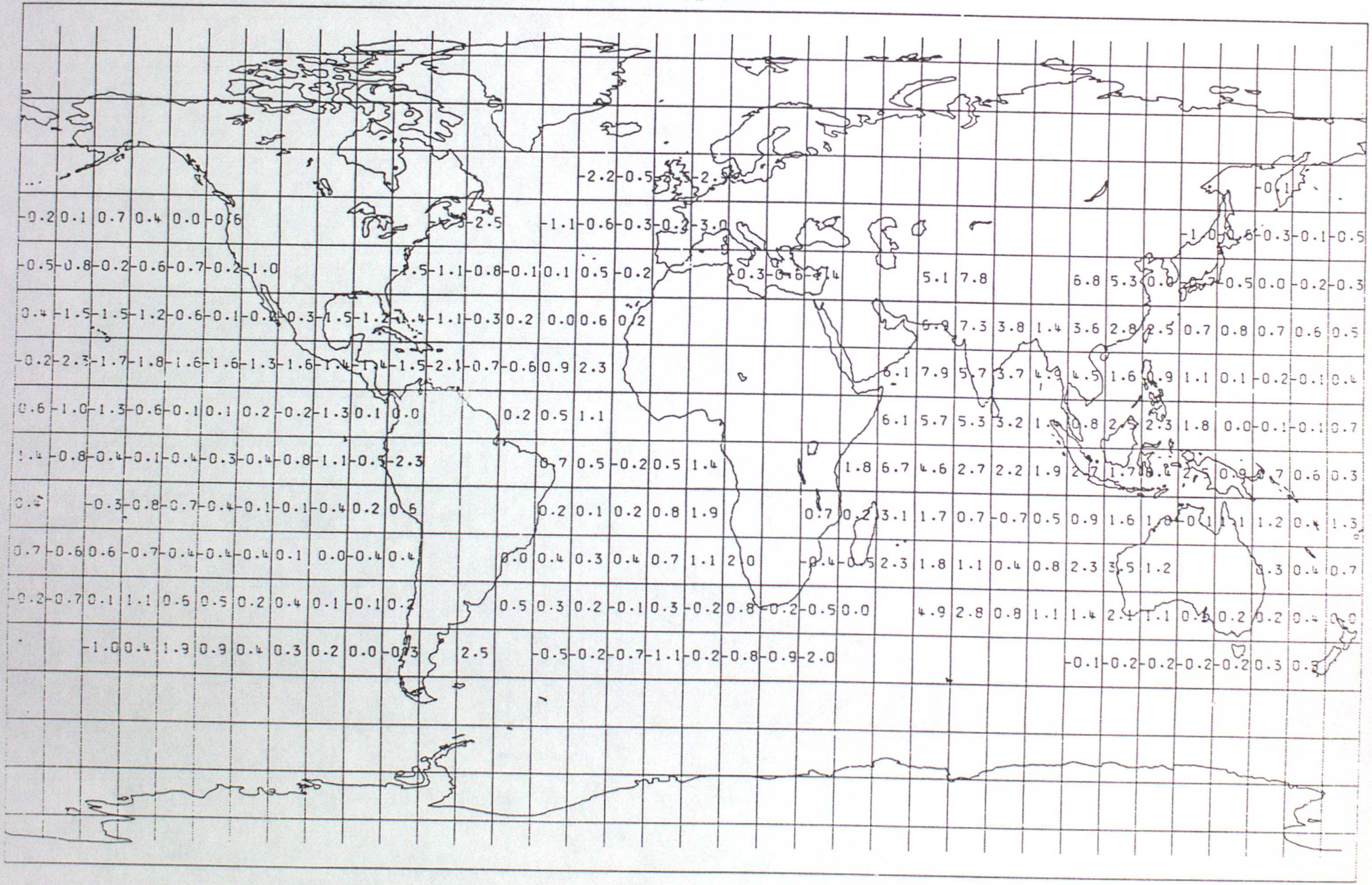

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA
MARCH 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

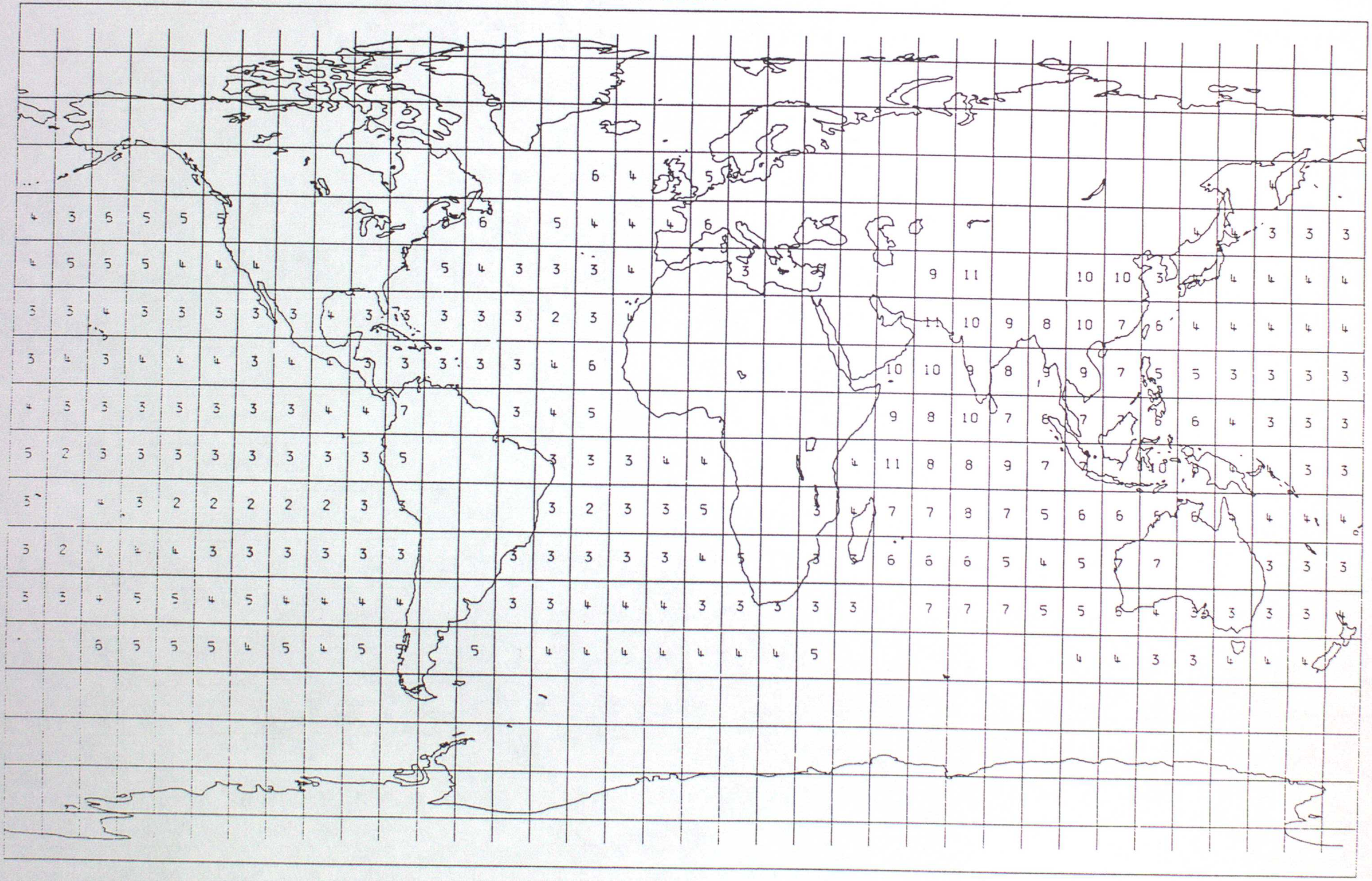
FIGURE 12



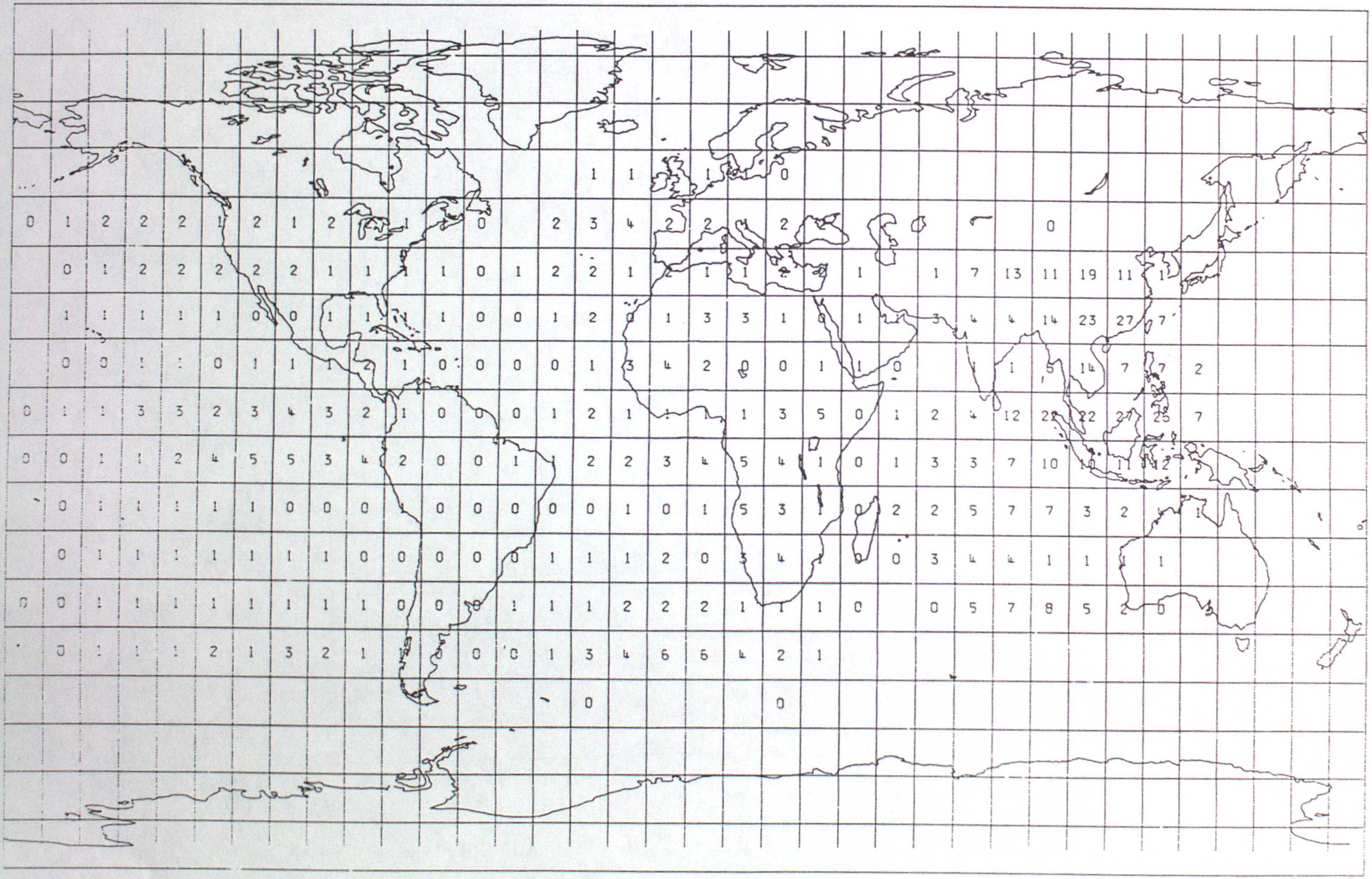
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
MARCH 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-2.2 -0.5 -2.5
-0.1
-0.2 0.1 0.7 0.4 0.0 -0.6
-2.5
-1.1 -0.6 -0.3 -0.2 -3.0
-1.0 -0.6 -0.3 -0.1 -0.5
-0.5 -0.8 -0.2 -0.6 -0.7 -0.2 -1.0
-1.5 -1.1 -0.8 -0.1 0.1 0.5 -0.2
0.3 -0.6 -4.4
5.1 7.8
6.8 5.3 0.0 -0.7 -0.5 0.0 -0.2 -0.3
0.4 -1.5 -1.5 -1.2 -0.6 -0.1 -0.2 0.3 -1.5 -1.2 -1.4 -1.1 -0.3 0.2 0.0 0.6 0.2
6.9 7.3 3.8 1.4 3.6 2.8 2.5 0.7 0.8 0.7 0.6 0.5
-0.2 -2.3 -1.7 -1.8 -1.6 -1.6 -1.3 -1.6 -1.4 -1.4 -1.5 -2.1 -0.7 -0.6 0.9 2.3
6.1 7.9 5.7 3.7 4.9 4.5 1.6 0.9 1.1 0.1 -0.2 -0.1 0.4
0.6 -1.0 -1.3 -0.6 -0.1 0.1 0.2 -0.2 -1.3 0.1 0.0
0.2 0.5 1.1
6.1 5.7 5.3 3.2 1.4 0.8 2.5 2.3 1.8 0.0 -0.1 -0.1 0.7
1.4 -0.8 -0.4 -0.1 -0.4 -0.3 -0.4 -0.8 -1.1 -0.5 -2.3
0.7 0.5 -0.2 0.5 1.4
1.8 6.7 4.6 2.7 2.2 1.9 2.7 1.7 0.4 2.5 0.9 0.7 0.6 0.3
0.4
-0.3 -0.8 -0.7 -0.4 -0.1 -0.1 -0.4 0.2 0.6
0.2 0.1 0.2 0.8 1.9
0.7 0.2 3.1 1.7 0.7 -0.7 0.5 0.9 1.6 1.0 -0.1 1.1 1.2 0.4 1.3
0.7 -0.6 0.6 -0.7 -0.4 -0.4 -0.4 0.1 0.0 -0.4 0.4
0.0 0.4 0.3 0.4 0.7 1.1 2.0
-0.4 -0.5 2.3 1.8 1.1 0.4 0.8 2.3 3.5 1.2
0.3 0.4 0.7
-0.2 -0.7 0.1 1.1 0.5 0.5 0.2 0.4 0.1 -0.1 0.2
0.5 0.3 0.2 -0.1 0.3 -0.2 0.8 -0.2 -0.5 0.0
4.9 2.8 0.8 1.1 1.4 2.1 1.1 0.5 0.2 0.2 0.4 0.0
-1.0 0.4 1.3 0.9 0.4 0.3 0.2 0.0 -0.3
2.5
-0.5 -0.2 -0.7 -1.1 -0.2 -0.8 -0.9 -2.0
-0.1 -0.2 -0.2 -0.2 -0.2 0.3 0.5

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
MARCH 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

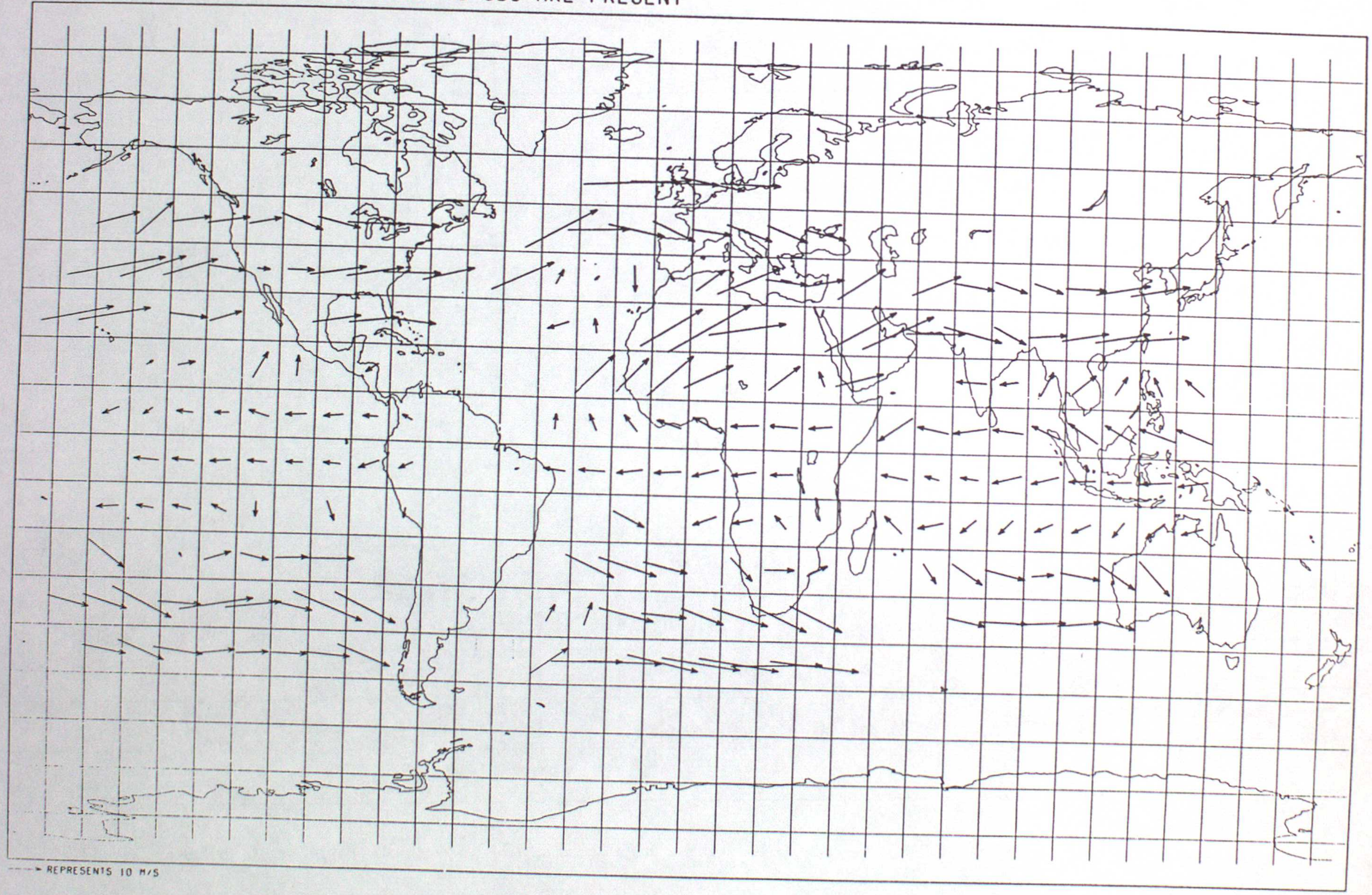

6 4 5 4
4 3 6 5 5 5 6 5 4 4 4 6 4 4 3 3 3
4 5 5 5 4 4 4 5 4 3 3 3 4 3 9 11 10 10 3 4 4 4 4
3 3 4 3 3 3 3 3 4 3 3 3 3 3 2 3 4 11 10 9 8 10 7 6 4 4 4 4 4
3 4 3 4 4 4 3 4 4 3 3 3 3 3 4 6 10 10 9 8 9 9 7 5 5 3 3 3 3
4 3 3 3 3 3 3 3 4 4 7 3 4 5 9 8 10 7 6 7 7 6 6 4 3 3 3
5 2 3 3 3 3 3 3 3 3 5 3 3 3 4 4 4 11 8 8 9 7 7 7 10 4 4 3 3
3 4 3 2 2 2 2 2 3 3 3 2 3 3 5 3 4 7 7 8 7 5 6 6 6 6 4 4 4
3 2 4 4 4 3 3 3 3 3 3 3 3 3 3 3 4 5 3 3 6 6 6 5 4 5 7 7 3 3 3
3 3 4 5 5 4 5 4 4 4 4 3 3 4 4 4 3 3 3 3 3 7 7 7 5 5 6 4 3 3 3 3 4
6 5 5 5 4 5 4 5 5 4 4 4 4 4 4 4 5 4 4 3 3 4 4 4

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
MARCH 1994


1 1 1 0
0 1 2 2 2 1 2 1 2 1 0 2 3 4 2 2 2 0
0 1 2 2 2 2 2 1 1 1 1 0 1 2 2 1 2 1 1 2 2 1 1 7 13 11 19 11 1
1 1 1 1 1 0 0 1 1 1 1 0 0 1 2 0 1 3 3 1 0 1 1 3 4 4 14 23 27 7
0 0 1 1 0 1 1 1 2 1 0 0 0 0 1 3 4 2 0 0 1 1 0 1 1 5 14 7 7 2
0 1 1 3 3 2 3 4 3 2 1 0 0 0 1 2 1 1 1 1 3 5 0 1 2 4 12 22 22 27 25 7
0 0 1 1 2 4 5 5 3 4 2 0 0 1 1 2 2 3 4 5 4 1 0 1 3 3 7 10 10 11 12
0 1 1 1 1 1 0 0 0 1 0 0 0 0 0 1 0 1 5 3 1 0 2 2 5 7 7 3 2 4 1
0 1 1 1 1 1 1 1 0 0 0 0 0 1 1 1 2 0 3 4 1 0 0 3 4 4 1 1 1 1
0 0 1 1 1 1 1 1 1 1 0 0 0 1 1 1 2 2 2 1 1 1 0 0 5 7 8 5 2 0
0 1 1 1 2 1 3 2 1 1 0 0 0 1 3 4 6 6 4 2 1
0 0

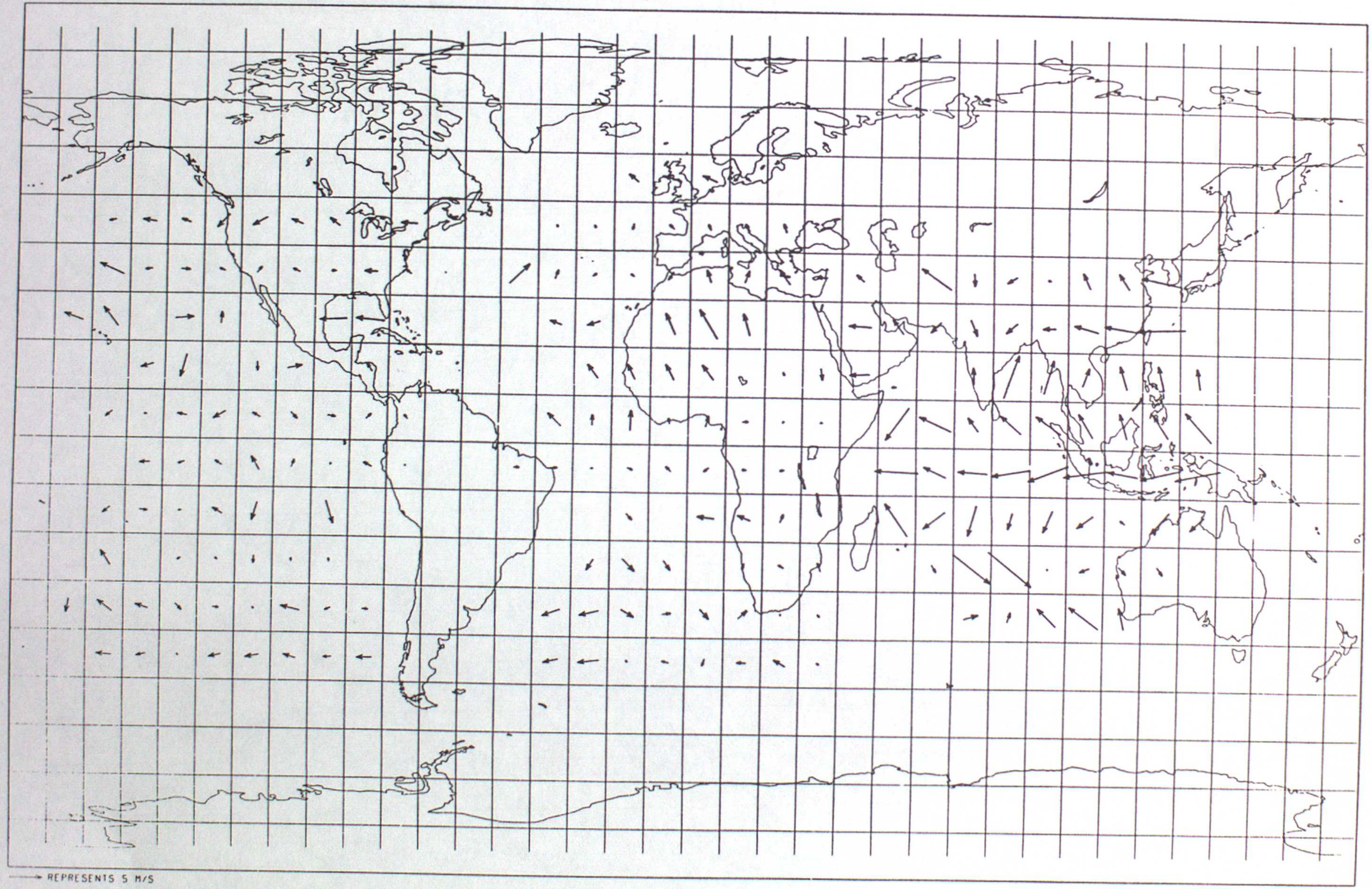
SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA
MARCH 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

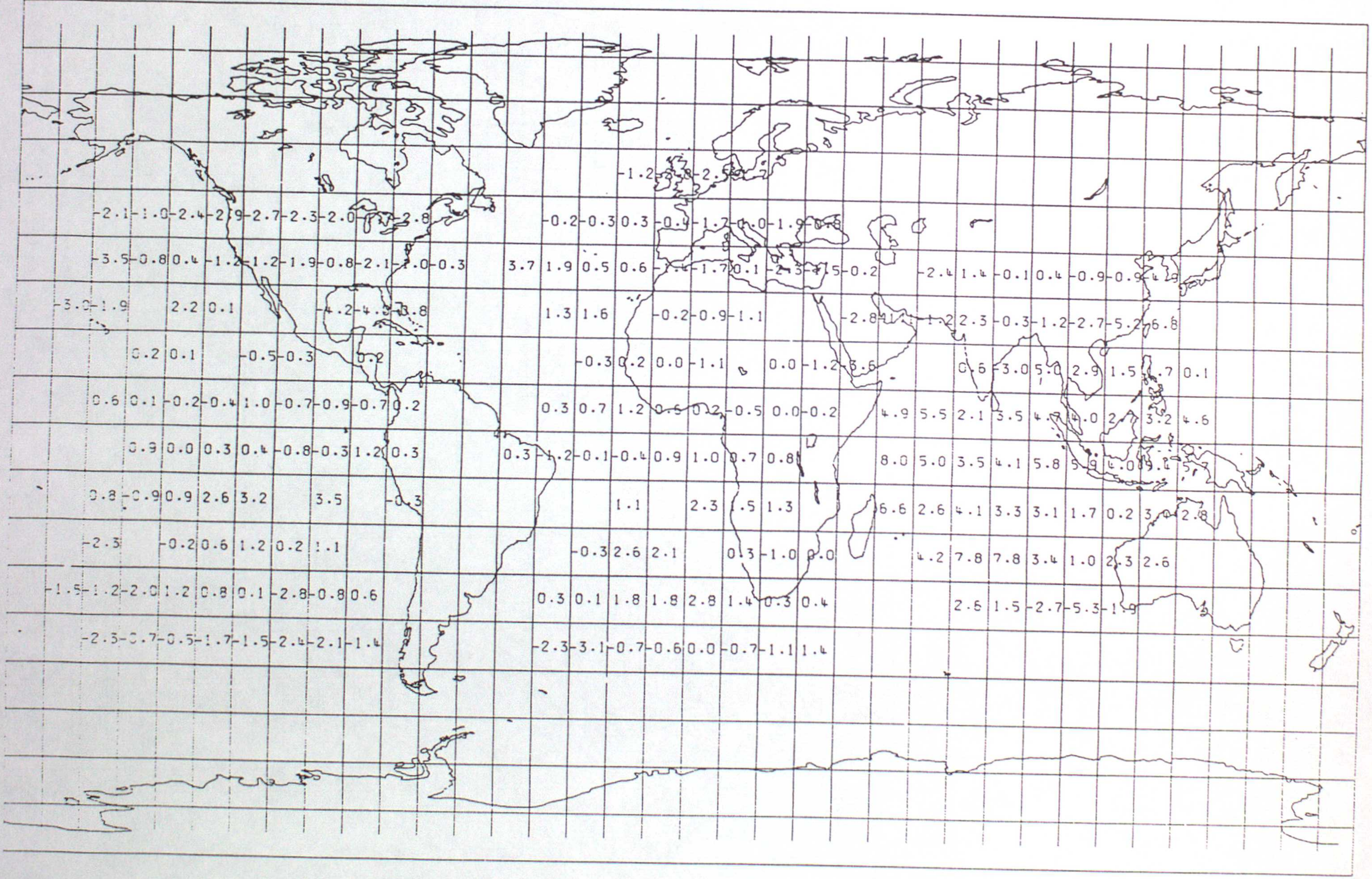

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA
MARCH 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

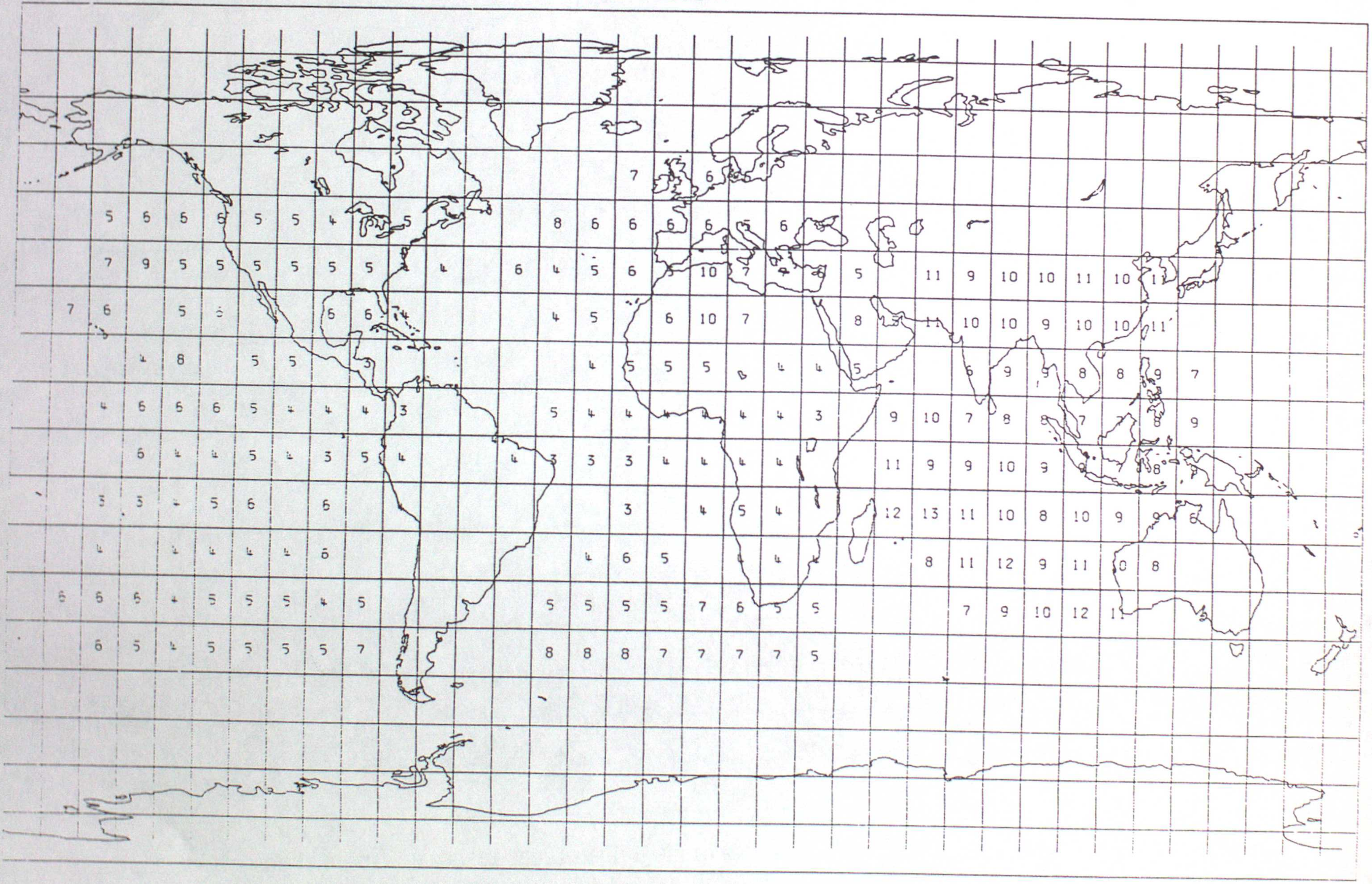
FIGURE 17


REPRESENTS 5 M/S

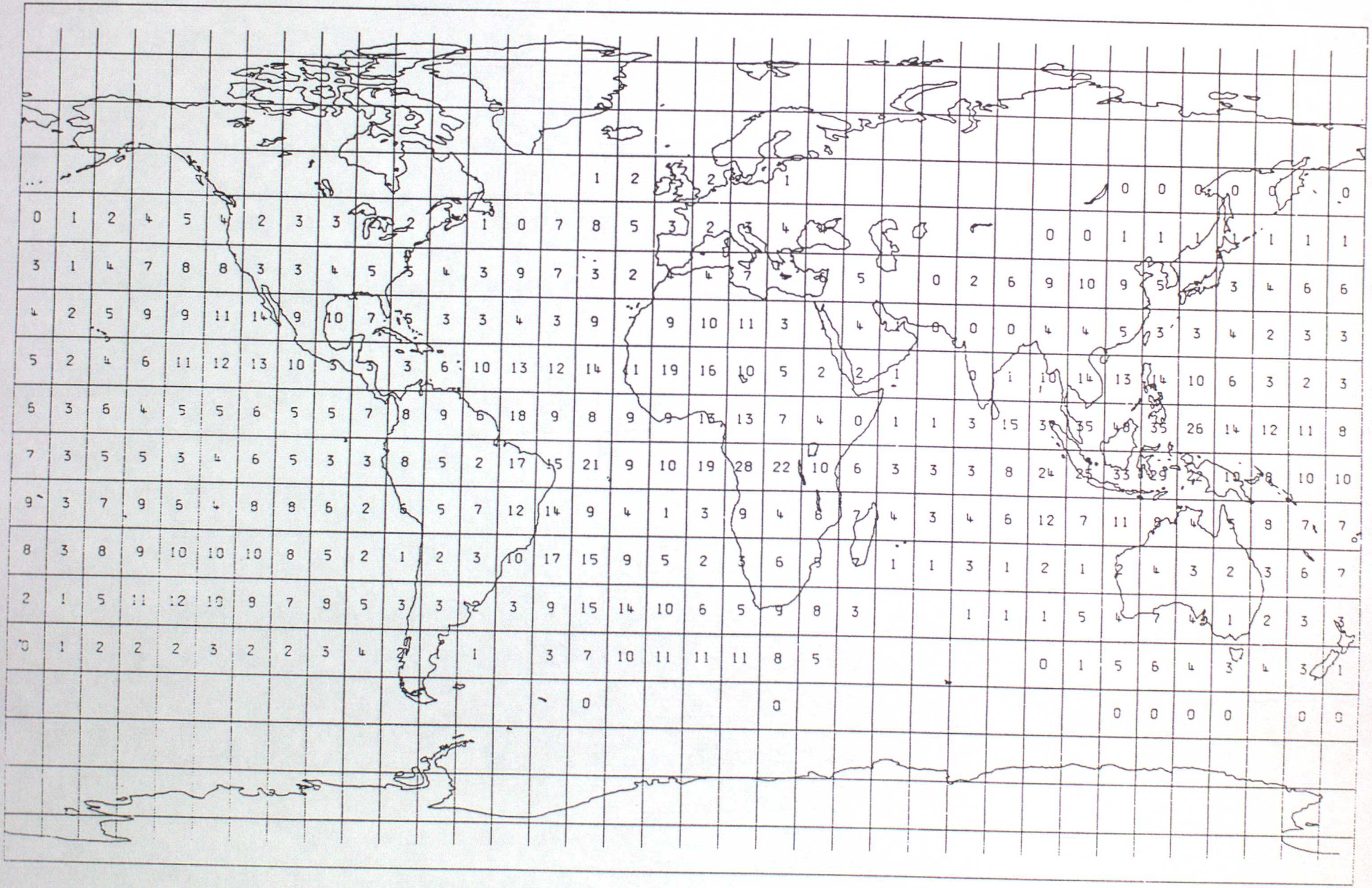
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
MARCH 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.2 -2.8 -2.5
-2.1 -1.0 -2.4 -2.9 -2.7 -2.3 -2.0 -2.8 -0.2 -0.3 0.3 -0.4 -1.7 -1.0 -1.9 -0.8
-3.5 -0.8 0.4 -1.2 -1.2 -1.9 -0.8 -2.1 -1.0 -0.3 3.7 1.9 0.5 0.6 -1.4 -1.7 0.1 -2.3 -1.5 -0.2 -2.4 1.4 -0.1 0.4 -0.9 -0.9 4.9
-3.0 -1.9 2.2 0.1 -4.2 -4.5 3.8 1.3 1.6 -0.2 -0.9 -1.1 -2.8 -1.2 2.3 -0.3 -1.2 -2.7 -5.2 6.8
0.2 0.1 -0.5 -0.3 0.2 -0.3 0.2 0.0 -1.1 0.0 -1.2 3.6 0.6 -3.0 5.0 2.9 1.5 1.7 0.1
0.6 0.1 -0.2 -0.4 1.0 -0.7 -0.9 -0.7 0.2 0.3 0.7 1.2 0.6 0.2 -0.5 0.0 -0.2 4.9 5.5 2.1 3.5 4.7 4.0 2.7 3.2 4.6
0.9 0.0 0.3 0.4 -0.8 -0.3 1.2 0.3 0.3 -1.2 -0.1 -0.4 0.9 1.0 0.7 0.8 8.0 5.0 3.5 4.1 5.8 5.9 4.0 9.4 5.7
0.8 -0.9 0.9 2.6 3.2 3.5 -0.3 1.1 2.3 1.5 1.3 6.6 2.6 4.1 3.3 3.1 1.7 0.2 3.0 2.8
-2.3 -0.2 0.6 1.2 0.2 1.1 -0.3 2.6 2.1 0.3 -1.0 0.0 4.2 7.8 7.8 3.4 1.0 2.3 2.6
-1.5 -1.2 -2.0 1.2 0.8 0.1 -2.8 -0.8 0.6 0.3 0.1 1.8 1.8 2.8 1.4 0.3 0.4 2.6 1.5 -2.7 -5.3 -1.9
-2.3 -0.7 -0.5 -1.7 -1.5 -2.4 -2.1 -1.4 -2.3 -3.1 -0.7 -0.6 0.0 -0.7 -1.1 1.4

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
MARCH 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

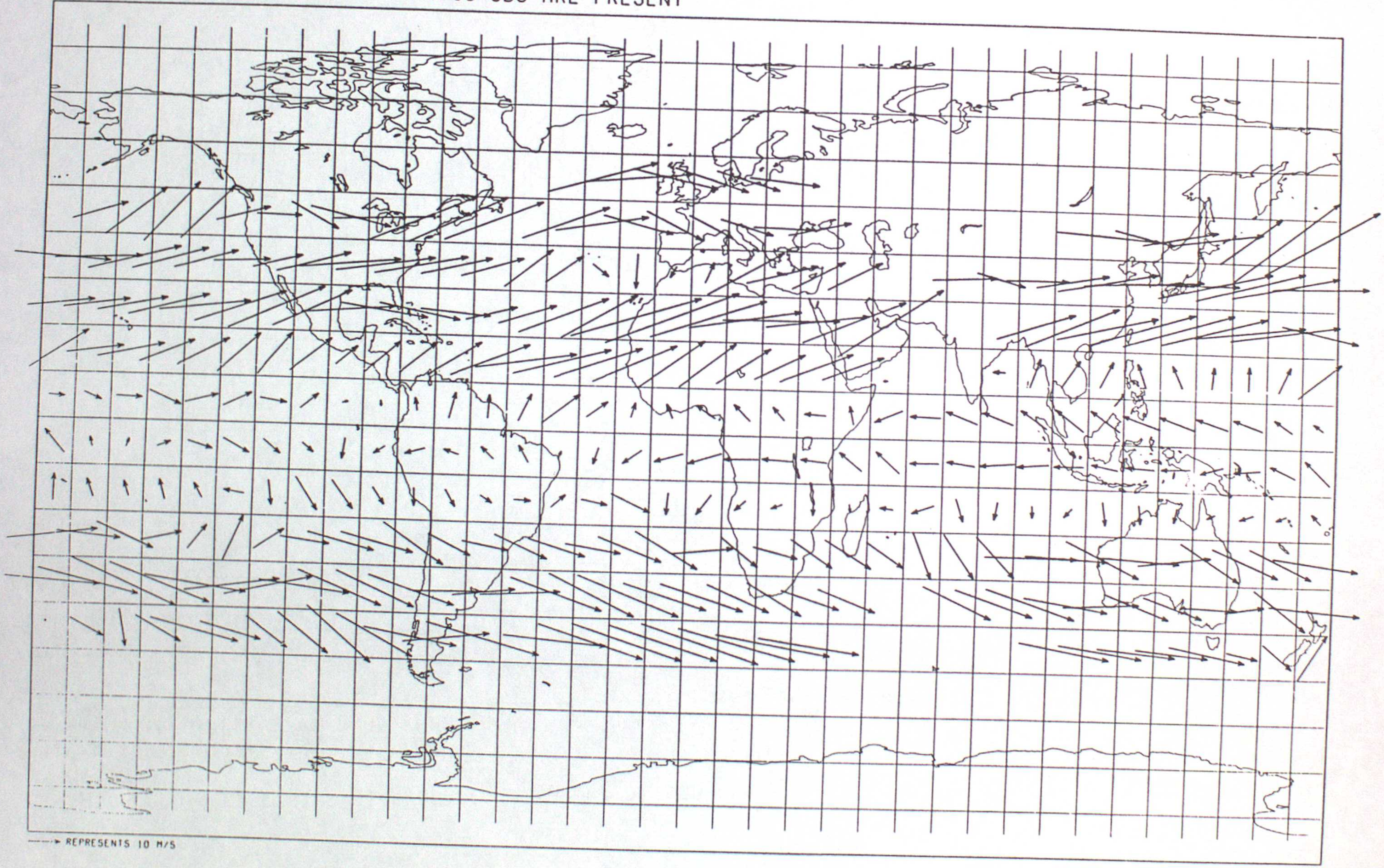

7 6
5 6 6 6 5 5 4 5 8 6 6 6 6 5 6
7 9 5 5 5 5 5 5 4 6 4 5 6 5 10 7 4 6 5 11 9 10 10 11 10 11
7 6 5 6 6 6 4 5 6 10 7 8 11 10 10 9 10 10 11
4 8 5 5 3 4 5 5 5 6 4 4 5 6 9 9 8 8 9 7
4 6 6 6 5 4 4 4 3 5 4 4 4 4 4 4 3 9 10 7 8 8 7 7 8 9
6 4 4 5 4 3 5 4 4 3 3 3 4 4 4 4 11 9 9 10 9 9 7 8
3 3 4 5 6 6 3 4 5 4 12 13 11 10 8 10 9 9 6
4 4 4 4 4 6 4 6 5 4 4 4 8 11 12 9 11 10 8
6 6 6 4 5 5 5 4 5 5 5 5 5 7 6 5 5 7 9 10 12 11
6 5 4 5 5 5 5 7 8 8 8 7 7 7 7 5

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
MARCH 1994


1 2 2 1 0 0 0 0 0 0
0 1 2 4 5 4 2 3 3 2 1 0 7 8 5 3 2 3 4 0 0 1 1 1 1 1 1 1
3 1 4 7 8 8 3 3 4 5 5 4 3 9 7 3 2 4 7 6 5 0 2 6 9 10 9 5 3 4 6 6
4 2 5 9 9 11 14 9 10 7 5 3 3 4 3 9 7 9 10 11 3 4 0 0 0 4 4 5 3 3 4 2 3 3
5 2 4 6 11 12 13 10 3 3 3 6 10 13 12 14 11 19 16 10 5 2 2 1 0 1 10 14 13 14 10 6 3 2 3
6 3 6 4 5 5 6 5 5 7 8 9 6 18 9 8 9 9 15 13 7 4 0 1 1 3 15 37 35 48 35 26 14 12 11 8
7 3 5 5 3 4 6 5 3 3 8 5 2 17 15 21 9 10 19 28 22 10 6 3 3 3 8 24 25 33 29 22 12 8 10 10
9 3 7 9 6 4 8 8 6 2 6 5 7 12 14 9 4 1 3 9 4 6 7 4 3 4 6 12 7 11 8 4 5 8 7 7
8 3 8 9 10 10 10 8 5 2 1 2 3 10 17 15 9 5 2 3 6 5 7 1 1 3 1 2 1 2 4 3 2 3 6 7
2 1 5 11 12 10 9 7 9 5 3 3 2 3 9 15 14 10 6 5 9 8 3 1 1 1 5 4 7 4 1 2 3 3
0 1 2 2 2 3 2 2 3 4 2 1 3 7 10 11 11 11 8 5 0 1 5 6 4 3 4 3 1
0 0 0 0 0 0 0 0

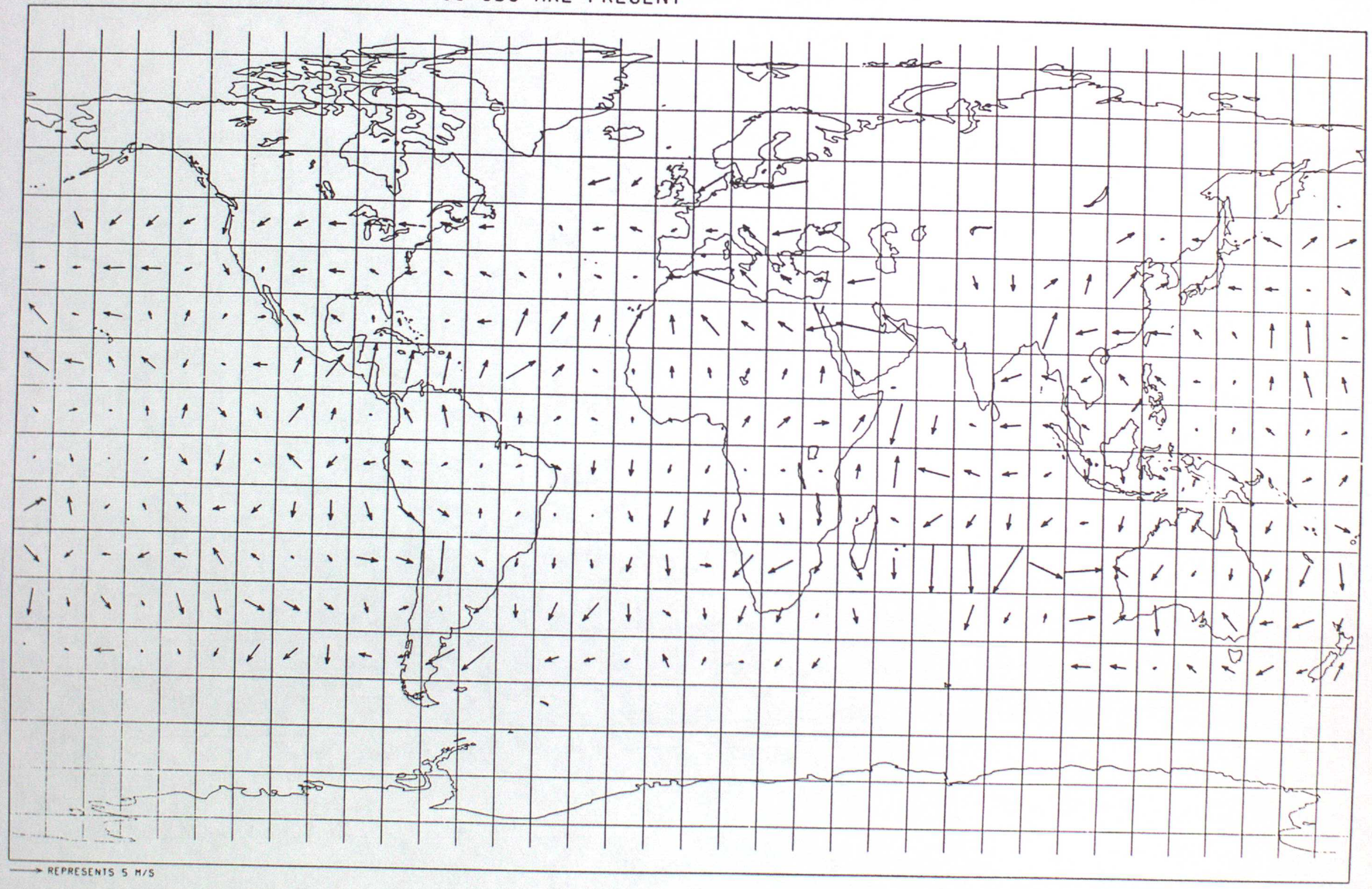
SATOB VECTOR MEAN WINDS BETWEEN 101-400 HPA
MARCH 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21

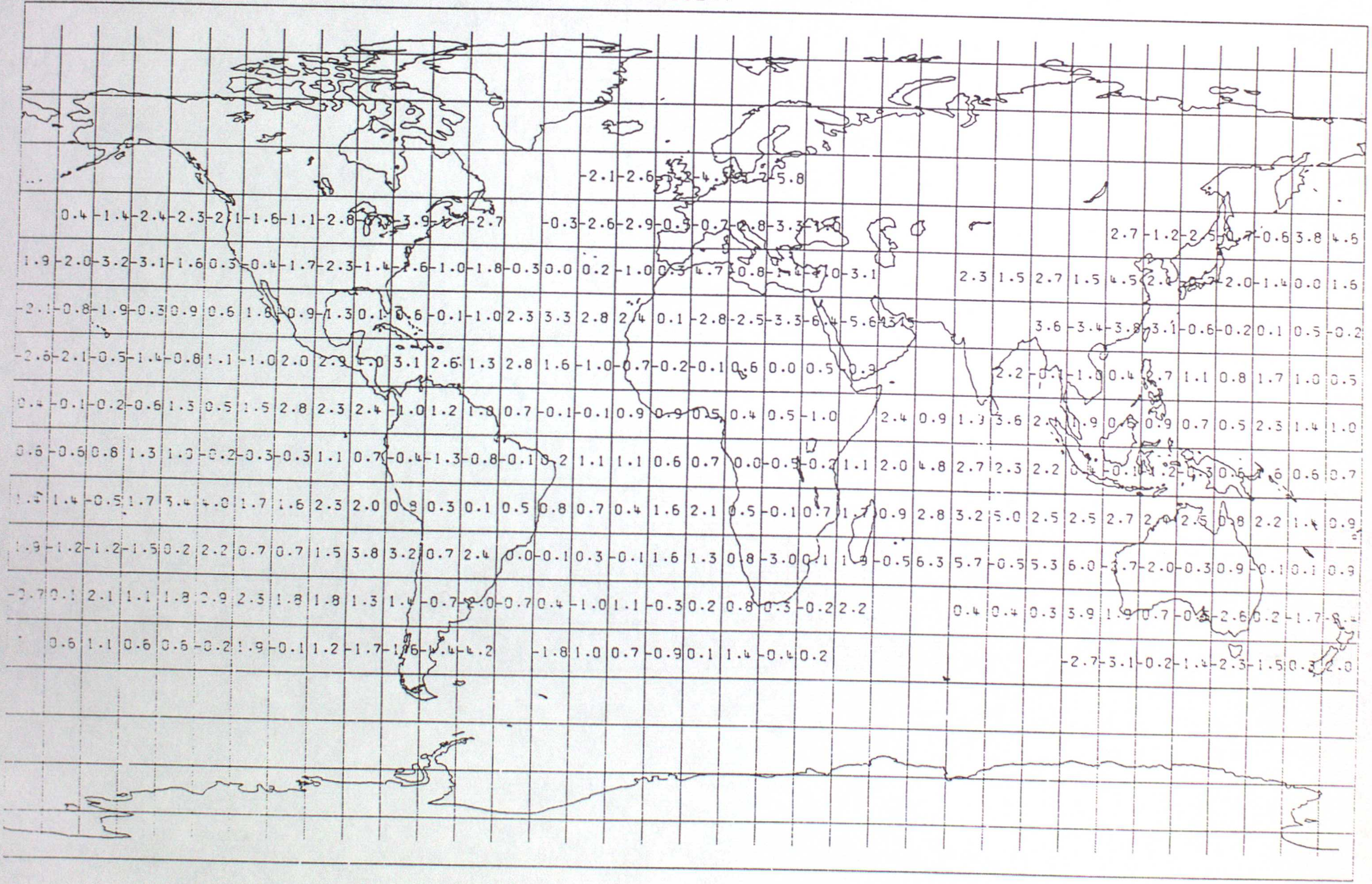

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA
MARCH 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

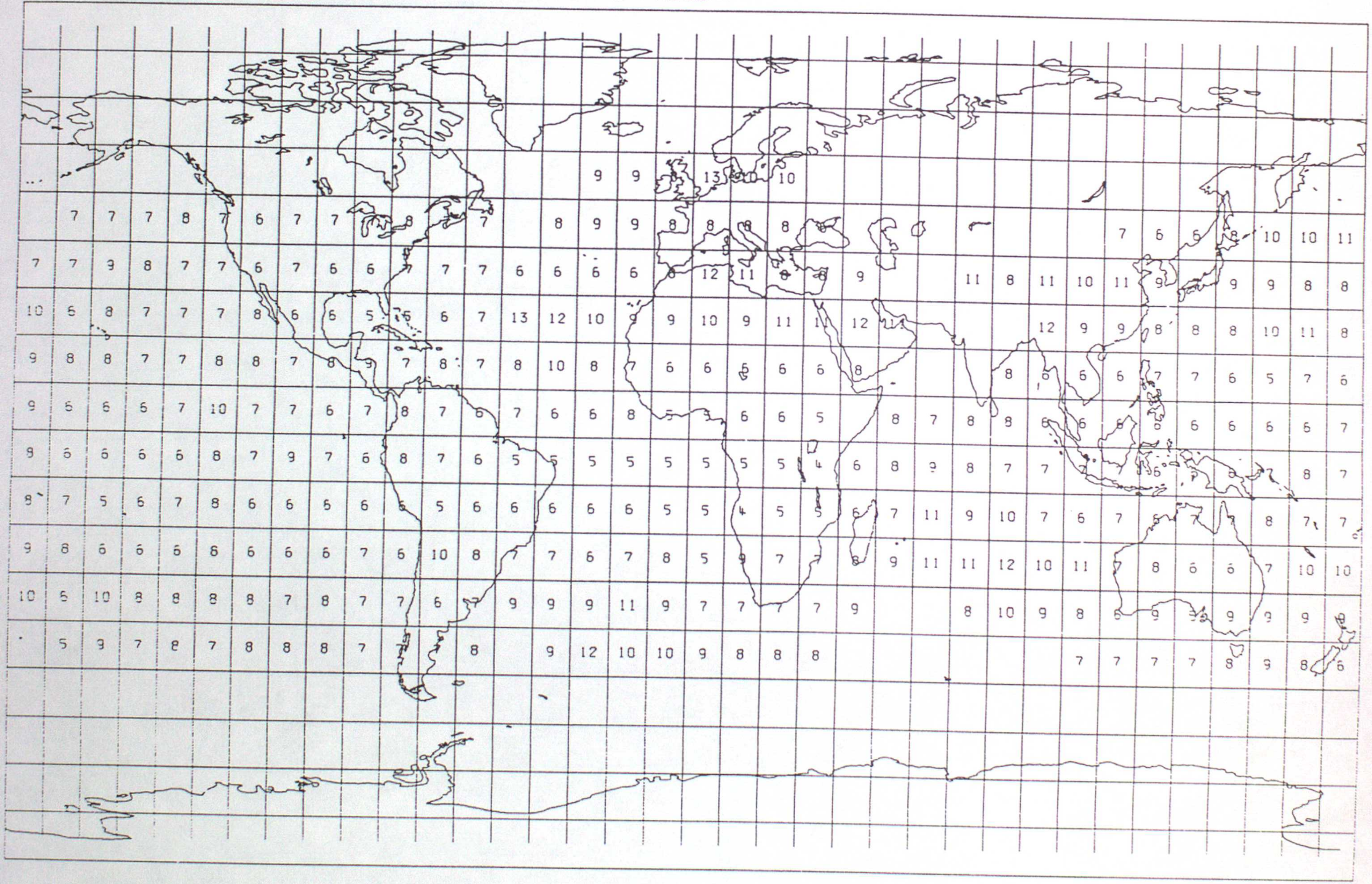
FIGURE 22


→ REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
MARCH 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-2.1 -2.6 -4.3 -5.8
0.4 -1.4 -2.4 -2.3 -2.1 -1.6 -1.1 -2.8 -3.9 -2.7 -0.3 -2.6 -2.9 -0.5 -0.7 -2.8 -3.3 2.7 -1.2 -2.5 -0.6 3.8 4.5
1.9 -2.0 -3.2 -3.1 -1.6 0.3 -0.4 -1.7 -2.3 -1.4 -1.6 -1.0 -1.8 -0.3 0.0 0.2 -1.0 0.3 4.7 -0.8 -3.1 2.3 1.5 2.7 1.5 4.5 2.4 -2.0 -1.4 0.0 1.6
-2.1 -0.8 -1.9 -0.3 0.9 0.6 1.6 -0.9 -1.3 0.1 -0.6 -0.1 -1.0 2.3 3.3 2.8 2.4 0.1 -2.8 -2.5 -3.3 -6.4 -5.6 3.6 -3.4 -3.8 -3.1 -0.6 -0.2 0.1 0.5 -0.2
-2.6 -2.1 -0.5 -1.4 -0.8 1.1 -1.0 2.0 2.9 4.0 3.1 2.6 1.3 2.8 1.6 -1.0 -0.7 -0.2 -0.1 0.6 0.0 0.5 -0.3 2.2 -0.1 -1.0 0.4 0.7 1.1 0.8 1.7 1.0 0.5
0.4 -0.1 -0.2 -0.6 1.3 0.5 1.5 2.8 2.3 2.4 -1.0 1.2 1.8 0.7 -0.1 -0.1 0.9 0.9 0.5 0.4 0.5 -1.0 2.4 0.9 1.3 3.6 2.4 1.9 0.6 0.9 0.7 0.5 2.3 1.4 1.0
0.6 -0.5 0.8 1.3 1.0 -0.2 -0.3 -0.3 1.1 0.7 -0.4 -1.3 -0.8 -0.1 0.2 1.1 1.1 0.6 0.7 0.0 -0.5 -0.2 1.1 2.0 4.8 2.7 2.3 2.2 0.4 -0.1 1.2 -0.3 0.6 1.6 0.6 0.7
1.4 1.4 -0.5 1.7 3.4 4.0 1.7 1.6 2.3 2.0 0.9 0.3 0.1 0.5 0.8 0.7 0.4 1.6 2.1 0.5 -0.1 0.7 1.7 0.9 2.8 3.2 5.0 2.5 2.5 2.7 2.0 2.5 0.8 2.2 1.4 0.9
1.9 -1.2 -1.2 -1.5 0.2 2.2 0.7 0.7 1.5 3.8 3.2 0.7 2.4 0.0 -0.1 0.3 -0.1 1.6 1.3 0.8 -3.0 0.1 1.9 -0.5 6.3 5.7 -0.5 5.3 6.0 -3.7 -2.0 -0.3 0.9 -0.1 0.1 0.9
-0.7 0.1 2.1 1.1 1.8 0.9 2.3 1.8 1.8 1.3 1.4 -0.7 2.0 -0.7 0.4 -1.0 1.1 -0.3 0.2 0.8 0.3 -0.2 2.2 0.4 0.4 0.3 3.9 1.9 0.7 -0.5 -2.6 0.2 -1.7
0.6 1.1 0.6 0.6 -0.2 1.9 -0.1 1.2 -1.7 -1.6 -4.4 -4.2 -1.8 1.0 0.7 -0.9 0.1 1.4 -0.4 0.2 -2.7 -3.1 -0.2 -1.4 -2.3 -1.5 0.3 2.0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
MARCH 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


9 9 13 10 10
7 7 7 8 7 6 7 7 8 7 8 9 9 8 8 8 8 7 6 6 8 10 10 11
7 7 9 8 7 7 6 7 6 6 7 7 7 6 6 6 6 8 12 11 8 8 9 11 8 11 10 11 9 9 9 8 8
10 6 8 7 7 7 8 6 6 5 5 6 7 13 12 10 9 9 10 9 11 11 12 11 12 9 9 8 8 8 10 11 8
9 8 8 7 7 8 8 7 8 9 7 8 7 8 10 8 7 6 6 5 6 6 8 8 6 6 6 7 7 6 5 7 6
9 6 6 6 7 10 7 7 6 7 8 7 6 7 6 6 8 5 5 6 6 5 8 7 8 8 6 6 6 6 6 6 6 6 7
8 6 6 6 6 8 7 9 7 6 8 7 6 5 5 5 5 5 5 5 5 4 6 8 9 8 7 7 7 7 6 7 5 7 8 7
8 7 5 6 7 8 6 6 5 6 6 5 6 6 6 6 6 5 5 4 5 5 6 7 11 9 10 7 6 7 6 7 7 8 7 7
9 8 6 6 6 6 6 6 6 7 6 10 8 7 7 6 7 8 5 9 7 7 8 9 11 11 12 10 11 7 8 6 6 7 10 10
10 6 10 8 8 8 8 7 8 7 7 6 7 9 9 9 11 9 7 7 7 7 9 8 10 9 8 6 9 9 9 9 9 9
5 9 7 8 7 8 8 8 7 7 7 8 9 12 10 10 9 8 8 8 7 7 7 7 8 9 8 6

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-11, NOAA-12 500 km.

Standard of comparison :Background field from Bracknell global model.

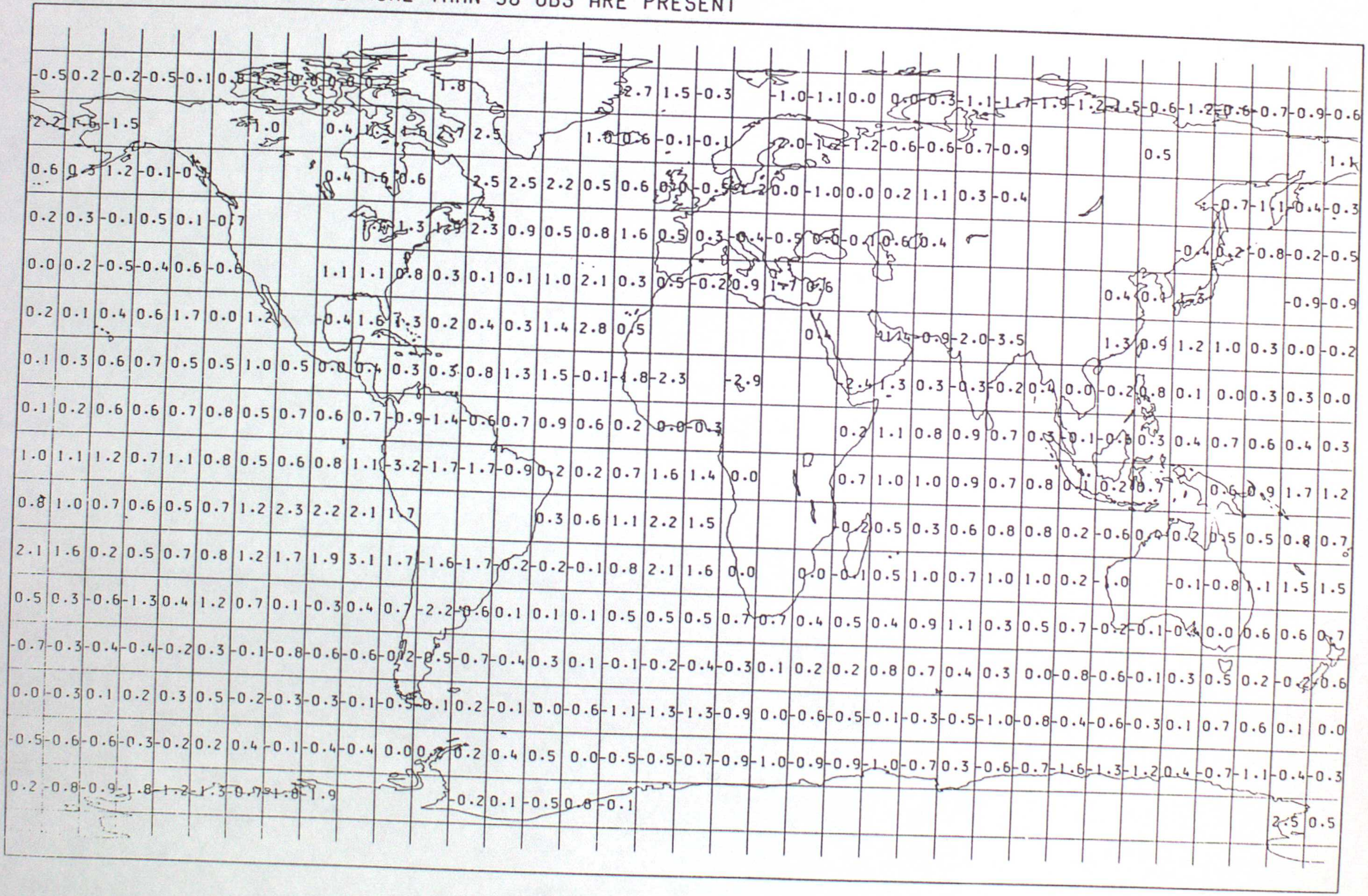
Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer:850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

:Mean observation minus background temperature differences

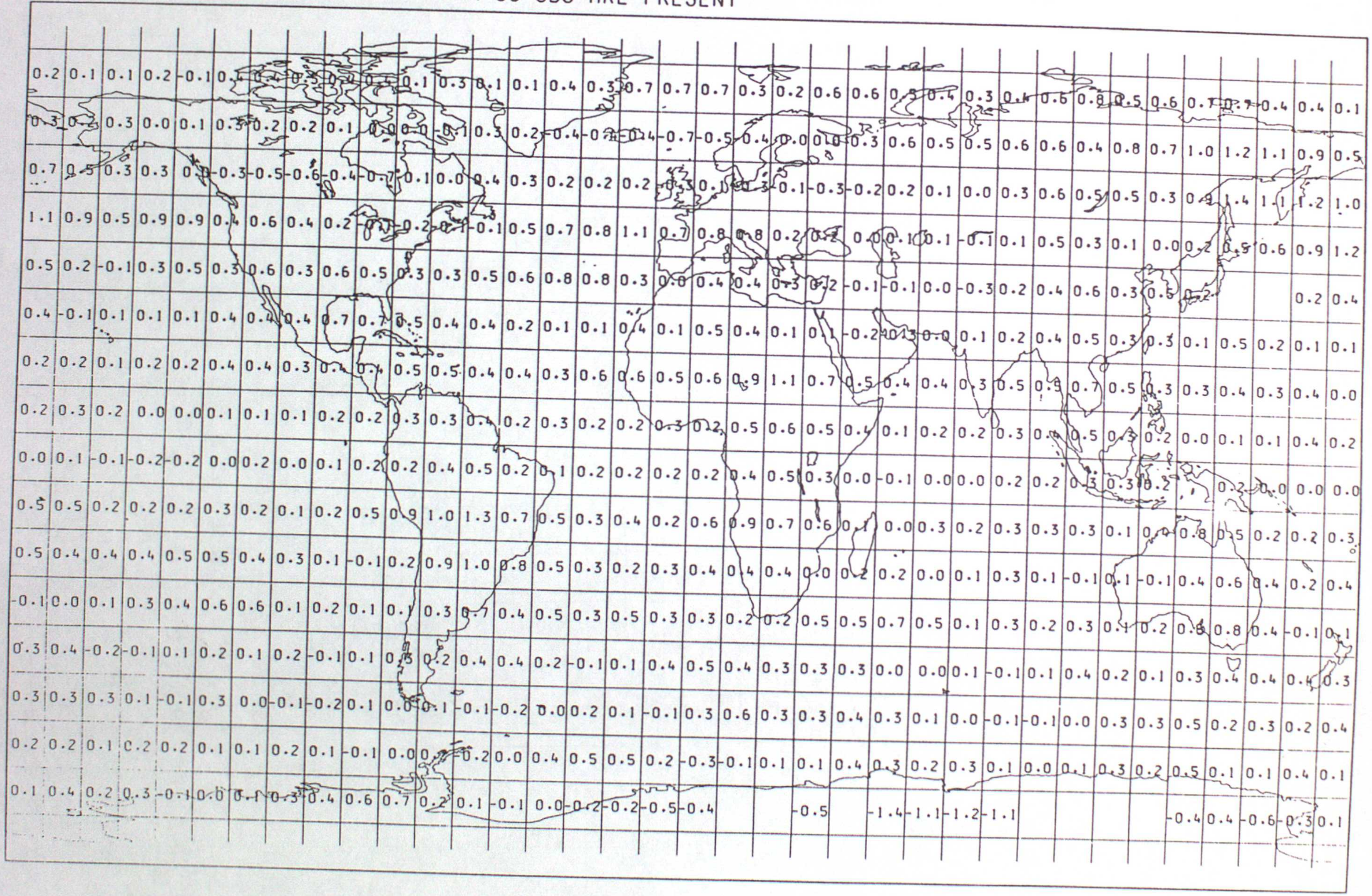
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
MARCH 1994
NOAA-11. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 25


-0.5 0.2 -0.2 -0.5 -0.1 0.8 1.2 0.8 0.8 0.7 1.8 2.7 1.5 -0.3 -1.0 -1.1 0.0 0.0 -0.3 -1.1 -1.7 -1.9 -1.2 -1.5 -0.6 -1.2 -0.6 -0.7 -0.9 -0.6
2.2 1.6 -1.5 1.0 0.4 1.3 1.6 2.7 2.5 1.0 0.6 -0.1 -0.1 2.0 -1.2 -1.2 -0.6 -0.6 -0.7 -0.9 0.5 1.1
0.6 0.3 1.2 -0.1 -0.3 0.4 1.6 0.6 2.5 2.5 2.2 0.5 0.6 0.0 -0.5 2.0 0.0 -1.0 0.0 0.2 1.1 0.3 -0.4
0.2 0.3 -0.1 0.5 0.1 -0.7 1.3 1.3 2.3 0.9 0.5 0.8 1.6 0.5 0.3 -0.4 -0.5 0.0 -0.1 0.6 0.4 -0.7 -1.1 -0.4 -0.3
0.0 0.2 -0.5 -0.4 0.6 -0.6 1.1 1.1 0.8 0.3 0.1 0.1 1.0 2.1 0.3 0.5 -0.2 0.9 1.7 0.6 -0.4 0.2 -0.8 -0.2 -0.5
0.2 0.1 0.4 0.6 1.7 0.0 1.2 -0.4 1.6 1.3 0.2 0.4 0.3 1.4 2.8 0.5 0.4 0.4 1.3 -0.9 -0.9
0.1 0.3 0.6 0.7 0.5 0.5 1.0 0.5 0.0 0.4 0.3 0.3 0.8 1.3 1.5 -0.1 -1.8 -2.3 -2.9 0.4 1.4 -0.9 -2.0 -3.5 1.3 0.9 1.2 1.0 0.3 0.0 -0.2
0.1 0.2 0.6 0.6 0.7 0.8 0.5 0.7 0.6 0.7 -0.9 -1.4 -0.6 0.7 0.9 0.6 0.2 0.0 -0.3 -2.4 1.3 0.3 -0.3 -0.2 0.4 0.0 -0.2 0.8 0.1 0.0 0.3 0.3 0.0
1.0 1.1 1.2 0.7 1.1 0.8 0.5 0.6 0.8 1.1 -3.2 -1.7 -1.7 -0.9 0.2 0.2 0.7 1.6 1.4 0.0 0.2 1.1 0.8 0.9 0.7 0.3 -0.1 -0.3 0.3 0.4 0.7 0.6 0.4 0.3
0.8 1.0 0.7 0.6 0.5 0.7 1.2 2.3 2.2 2.1 1.7 0.7 1.0 1.0 0.9 0.7 0.8 0.1 0.2 0.7 0.6 0.9 1.7 1.2
2.1 1.6 0.2 0.5 0.7 0.8 1.2 1.7 1.9 3.1 1.7 0.3 0.6 1.1 2.2 1.5 -0.2 0.5 0.3 0.6 0.8 0.8 0.2 -0.6 0.4 0.2 0.5 0.5 0.8 0.7
0.5 0.3 -0.6 -1.3 0.4 1.2 0.7 0.1 -0.3 0.4 0.7 -1.6 -1.7 -0.2 -0.2 -0.1 0.8 2.1 1.6 0.0 0.0 -0.1 0.5 1.0 0.7 1.0 1.0 0.2 -1.0 -0.1 -0.8 1.1 1.5 1.5
-0.7 -0.3 -0.4 -0.4 -0.2 0.3 -0.1 -0.8 -0.6 -0.6 -0.2 -2.2 -0.6 0.1 0.1 0.1 0.5 0.5 0.5 0.7 0.7 0.4 0.5 0.4 0.9 1.1 0.3 0.5 0.7 -0.2 -0.1 -0.4 0.0 0.6 0.6 0.7
0.0 -0.3 0.1 0.2 0.3 0.5 -0.2 -0.3 -0.3 -0.1 -0.5 -0.5 -0.7 -0.4 0.3 0.1 -0.1 -0.2 -0.4 -0.3 0.1 0.2 0.2 0.8 0.7 0.4 0.3 0.0 -0.8 -0.6 -0.1 0.3 0.5 0.2 -0.2 0.6
-0.5 -0.6 -0.6 -0.3 -0.2 0.2 0.4 -0.1 -0.4 -0.4 0.0 0.1 0.2 -0.1 0.0 -0.6 -1.1 -1.3 -1.3 -0.9 0.0 -0.6 -0.5 -0.1 -0.3 -0.5 -1.0 -0.8 -0.4 -0.6 -0.3 0.1 0.7 0.6 0.1 0.0
0.2 -0.8 -0.9 -1.8 -1.2 -1.3 -0.7 -1.8 -1.9 0.2 0.4 0.5 0.0 -0.5 -0.5 -0.7 -0.9 -1.0 -0.9 -0.9 -1.0 -0.7 0.3 -0.6 -0.7 -1.6 -1.3 -1.2 0.4 -0.7 -1.1 -0.4 -0.3
-0.2 0.1 -0.5 0.8 -0.1
2.5 0.5

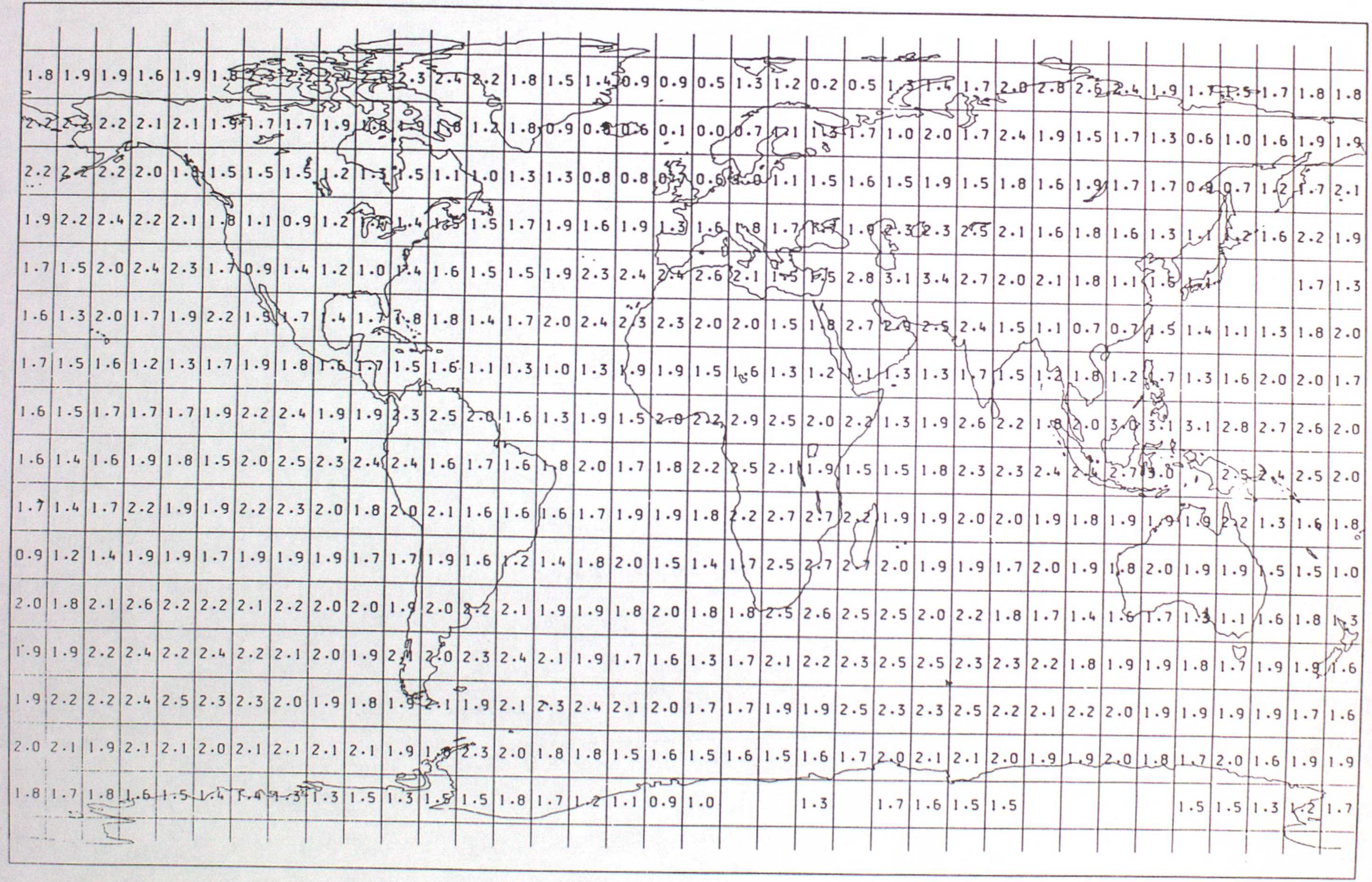
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
MARCH 1994
NOAA-11. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 26



500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
MARCH 1994
NOAA-11. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

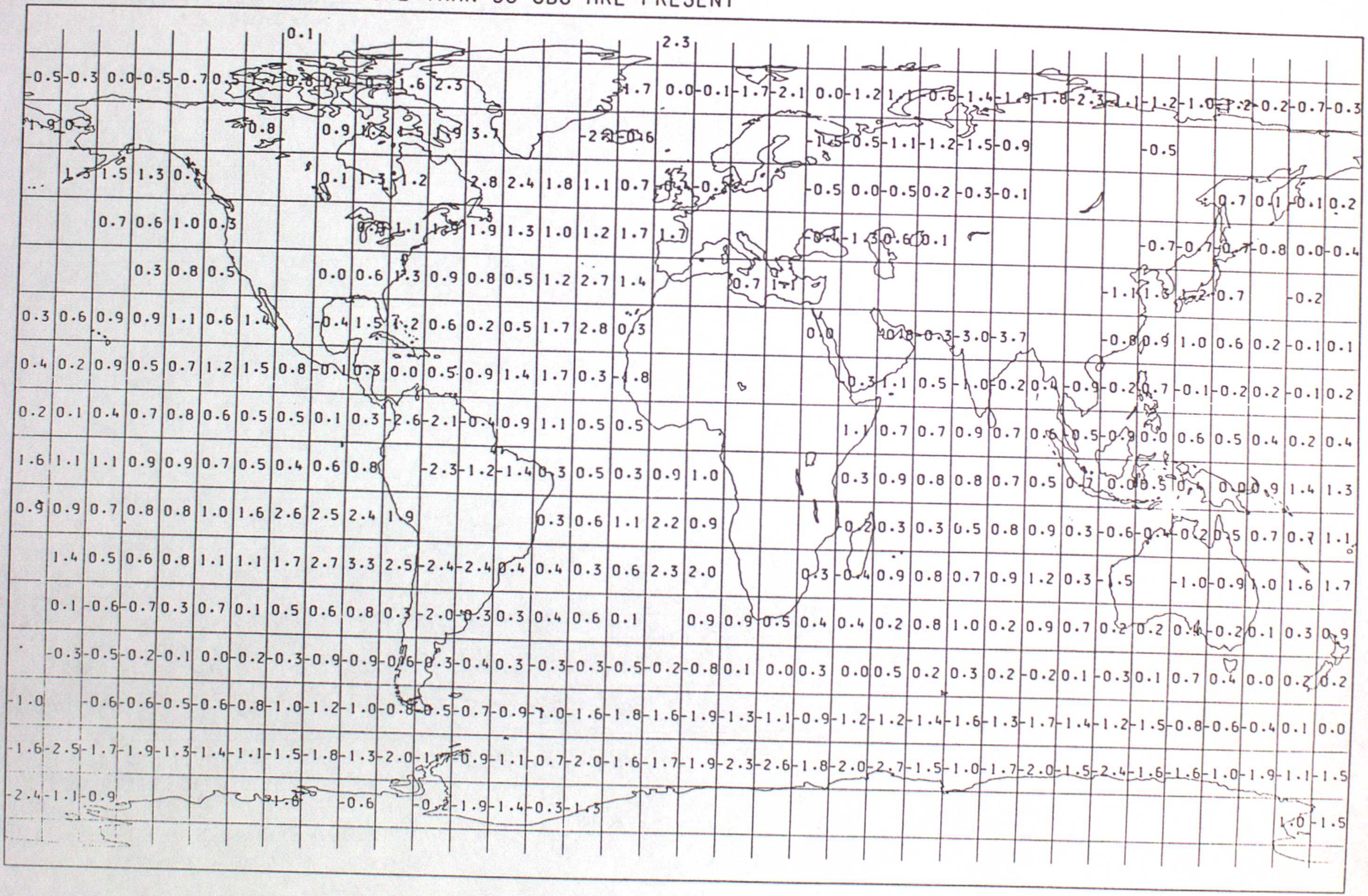
FIGURE 27



1.8	1.9	1.9	1.6	1.9	1.8	2.3	2.2	2.4	2.6	2.3	2.4	2.2	1.8	1.5	1.4	0.9	0.9	0.5	1.3	1.2	0.2	0.5	1.3	1.4	1.7	2.0	2.8	2.6	2.4	1.9	1.7	1.5	1.7	1.8	1.8
2.2	2.2	2.2	2.1	2.1	1.9	1.7	1.7	1.9	1.8	1.9	1.8	1.2	1.8	0.9	0.8	0.6	0.1	0.0	0.7	1.1	1.3	1.7	1.0	2.0	1.7	2.4	1.9	1.5	1.7	1.3	0.6	1.0	1.6	1.9	1.9
2.2	2.2	2.2	2.0	1.8	1.5	1.5	1.5	1.2	1.3	1.5	1.1	1.0	1.3	1.3	0.8	0.8	0.7	0.6	1.0	1.1	1.5	1.6	1.5	1.9	1.5	1.8	1.6	1.9	1.7	1.7	0.8	0.7	1.2	1.7	2.1
1.9	2.2	2.4	2.2	2.1	1.8	1.1	0.9	1.2	[illegible]	1.4	1.5	1.5	1.7	1.9	1.6	1.9	1.3	1.6	1.8	1.7	1.7	1.9	2.3	2.3	2.5	2.1	1.6	1.8	1.6	1.3	1.1	1.2	1.6	2.2	1.9
1.7	1.5	2.0	2.4	2.3	1.7	0.9	1.4	1.2	1.0	1.4	1.6	1.5	1.5	1.9	2.3	2.4	2.4	2.6	2.1	1.5	1.5	2.8	3.1	3.4	2.7	2.0	2.1	1.8	1.1	1.6	1.1			1.7	1.3
1.6	1.3	2.0	1.7	1.9	2.2	1.5	1.7	1.4	1.7	1.8	1.8	1.4	1.7	2.0	2.4	2.3	2.3	2.0	2.0	1.5	1.8	2.7	2.0	2.5	2.4	1.5	1.1	0.7	0.7	1.5	1.4	1.1	1.3	1.8	2.0
1.7	1.5	1.6	1.2	1.3	1.7	1.9	1.8	1.6	1.7	1.5	1.6	1.1	1.3	1.0	1.3	1.9	1.9	1.5	1.6	1.3	1.2	1.1	1.3	1.3	1.7	1.5	1.2	1.8	1.2	1.7	1.3	1.6	2.0	2.0	1.7
1.6	1.5	1.7	1.7	1.7	1.9	2.2	2.4	1.9	1.9	2.3	2.5	2.0	1.6	1.3	1.9	1.5	2.0	2.2	2.9	2.5	2.0	2.2	1.3	1.9	2.6	2.2	1.8	2.0	3.0	3.1	3.1	2.8	2.7	2.6	2.0
1.6	1.4	1.6	1.9	1.8	1.5	2.0	2.5	2.3	2.4	2.4	1.6	1.7	1.6	1.8	2.0	1.7	1.8	2.2	2.5	2.1	1.9	1.5	1.5	1.8	2.3	2.3	2.4	2.4	2.7	3.0		2.5	2.4	2.5	2.0
1.7	1.4	1.7	2.2	1.9	1.9	2.2	2.3	2.0	1.8	2.0	2.1	1.6	1.6	1.6	1.7	1.9	1.9	1.8	2.2	2.7	2.7	2.2	1.9	1.9	2.0	2.0	1.9	1.8	1.9	1.9	1.9	2.2	1.3	1.6	1.8
0.9	1.2	1.4	1.9	1.9	1.7	1.9	1.9	1.9	1.7	1.7	1.9	1.6	1.2	1.4	1.8	2.0	1.5	1.4	1.7	2.5	2.7	2.7	2.0	1.9	1.9	1.7	2.0	1.9	1.8	2.0	1.9	1.9	1.5	1.5	1.0
2.0	1.8	2.1	2.6	2.2	2.2	2.1	2.2	2.0	2.0	1.9	2.0	2.2	2.1	1.9	1.9	1.8	2.0	1.8	1.8	2.5	2.6	2.5	2.5	2.0	2.2	1.8	1.7	1.4	1.6	1.7	1.3	1.1	1.6	1.8	1.3
1.9	1.9	2.2	2.4	2.2	2.4	2.2	2.1	2.0	1.9	2.1	2.0	2.3	2.4	2.1	1.9	1.7	1.6	1.3	1.7	2.1	2.2	2.3	2.5	2.5	2.3	2.3	2.2	1.8	1.9	1.9	1.8	1.7	1.9	1.9	1.6
1.9	2.2	2.2	2.4	2.5	2.3	2.3	2.0	1.9	1.8	1.9	2.1	1.9	2.1	2.3	2.4	2.1	2.0	1.7	1.7	1.9	1.9	2.5	2.3	2.3	2.5	2.2	2.1	2.2	2.0	1.9	1.9	1.9	1.9	1.7	1.6
2.0	2.1	1.9	2.1	2.1	2.0	2.1	2.1	2.1	2.1	1.9	1.8	2.3	2.0	1.8	1.8	1.5	1.6	1.5	1.6	1.5	1.6	1.7	2.0	2.1	2.1	2.0	1.9	1.9	2.0	1.8	1.7	2.0	1.6	1.9	1.9
1.8	1.7	1.8	1.6	1.5	1.4	1.4	1.3	1.3	1.5	1.3	1.5	1.5	1.8	1.7	1.2	1.1	0.9	1.0			1.3		1.7	1.6	1.5	1.5					1.5	1.5	1.3	1.2	1.7

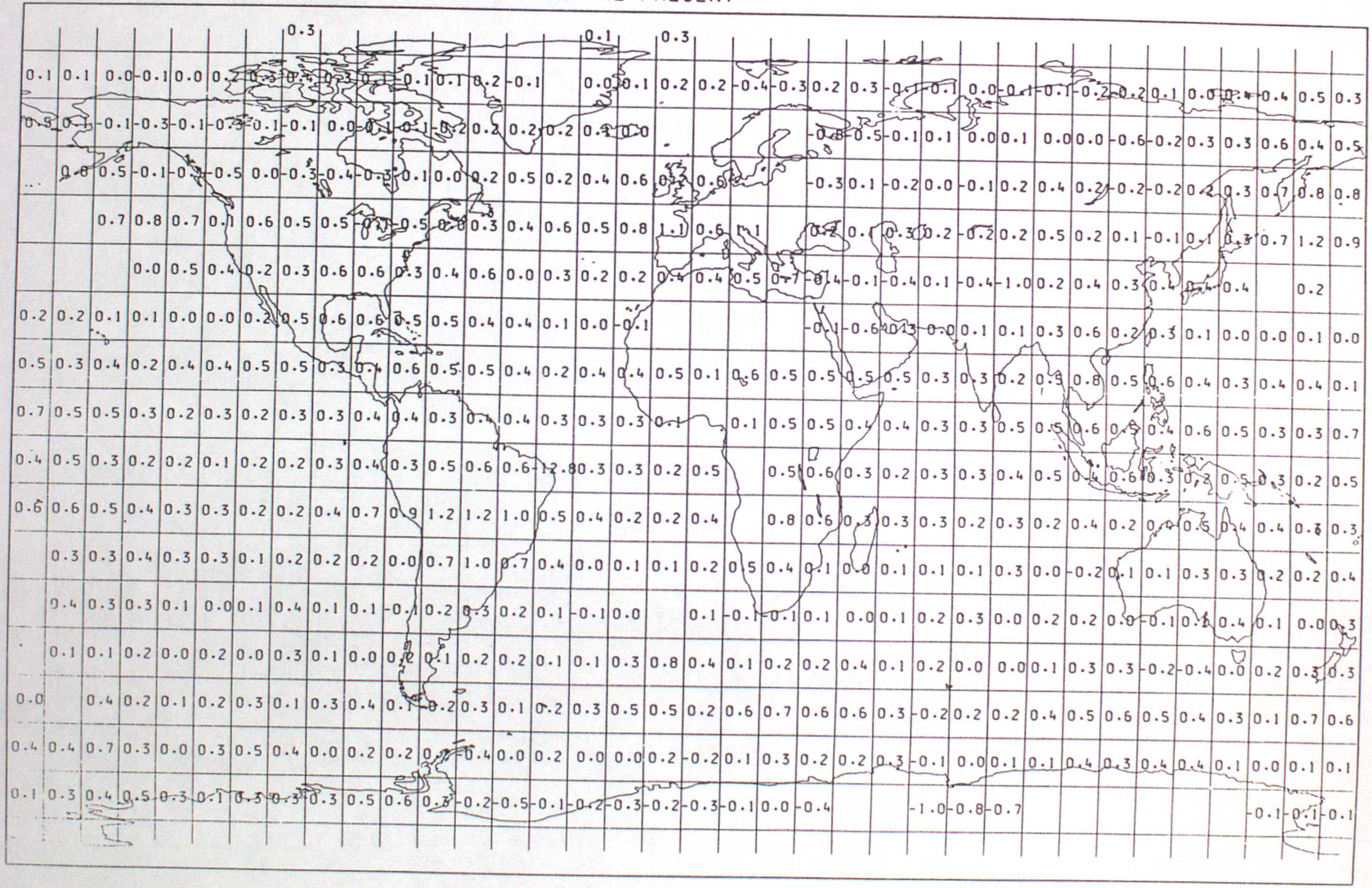
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
MARCH 1994
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 28



500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
MARCH 1994
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 29



500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
MARCH 1994
NOAA-12. USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 30

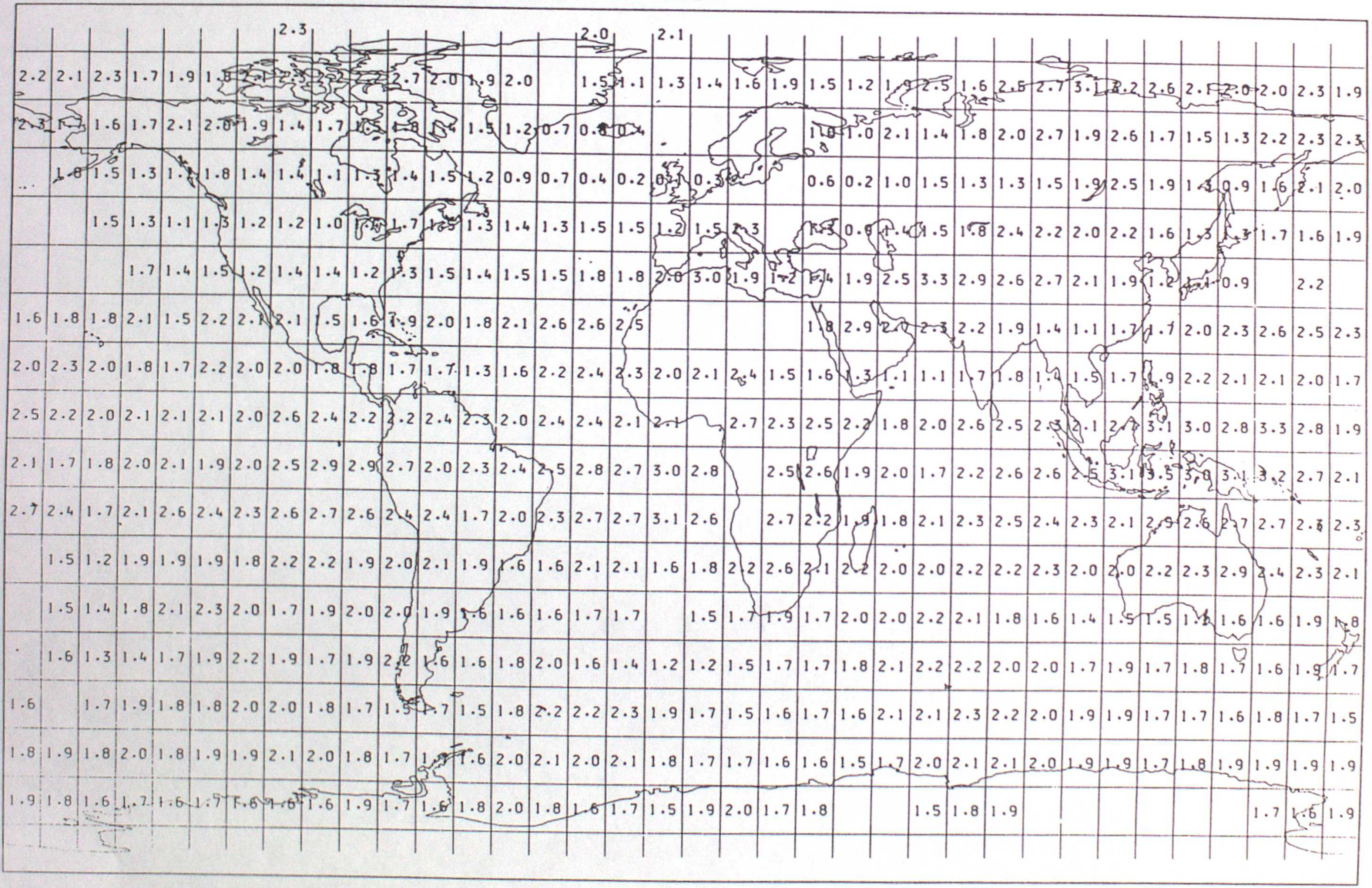

2.3 2.0 2.1
2.2 2.1 2.3 1.7 1.9 1.8 2.7 2.0 1.9 2.0 1.5 1.1 1.3 1.4 1.6 1.9 1.5 1.2 1.9 2.5 1.6 2.5 2.7 3.1 3.2 2.6 2.1 2.0 2.0 2.3 1.9
2.3 1.7 1.6 1.7 2.1 2.0 1.9 1.4 1.7 1.5 1.8 1.4 1.5 1.2 0.7 0.8 0.4 1.0 1.0 2.1 1.4 1.8 2.0 2.7 1.9 2.6 1.7 1.5 1.3 2.2 2.3 2.3
1.8 1.5 1.3 1.4 1.8 1.4 1.4 1.1 1.3 1.4 1.5 1.2 0.9 0.7 0.4 0.2 0.3 0.3 0.6 0.2 1.0 1.5 1.3 1.3 1.5 1.9 2.5 1.9 1.4 0.9 1.6 2.1 2.0
1.5 1.3 1.1 1.3 1.2 1.2 1.0 1.7 1.7 1.5 1.3 1.4 1.3 1.5 1.5 1.2 1.5 2.3 1.3 0.9 1.4 1.5 1.8 2.4 2.2 2.0 2.2 1.6 1.3 1.3 1.7 1.6 1.9
1.7 1.4 1.5 1.2 1.4 1.4 1.2 1.3 1.5 1.4 1.5 1.5 1.8 1.8 2.0 3.0 1.9 1.2 1.4 1.9 2.5 3.3 2.9 2.6 2.7 2.1 1.9 1.2 1.1 0.9 2.2
1.6 1.8 1.8 2.1 1.5 2.2 2.1 2.1 1.5 1.6 1.9 2.0 1.8 2.1 2.6 2.6 2.5 1.8 2.9 2.7 2.3 2.2 1.9 1.4 1.1 1.7 1.7 2.0 2.3 2.6 2.5 2.3
2.0 2.3 2.0 1.8 1.7 2.2 2.0 2.0 1.8 1.8 1.7 1.7 1.3 1.6 2.2 2.4 2.3 2.0 2.1 2.4 1.5 1.6 1.3 1.1 1.1 1.7 1.8 1.4 1.5 1.7 1.9 2.2 2.1 2.1 2.0 1.7
2.5 2.2 2.0 2.1 2.1 2.1 2.0 2.6 2.4 2.2 2.2 2.4 2.3 2.0 2.4 2.4 2.1 2.1 2.7 2.3 2.5 2.2 1.8 2.0 2.6 2.5 2.3 2.1 2.4 3.1 3.0 2.8 3.3 2.8 1.9
2.1 1.7 1.8 2.0 2.1 1.9 2.0 2.5 2.9 2.9 2.7 2.0 2.3 2.4 2.5 2.8 2.7 3.0 2.8 2.5 2.6 1.9 2.0 1.7 2.2 2.6 2.6 2.5 3.1 3.5 3.0 3.1 3.2 2.7 2.1
2.7 2.4 1.7 2.1 2.6 2.4 2.3 2.6 2.7 2.6 2.4 2.4 1.7 2.0 2.3 2.7 2.7 3.1 2.6 2.7 2.2 1.9 1.8 2.1 2.3 2.5 2.4 2.3 2.1 2.9 2.6 2.7 2.7 2.6 2.3
1.5 1.2 1.9 1.9 1.9 1.8 2.2 2.2 1.9 2.0 2.1 1.9 1.6 1.6 2.1 2.1 1.6 1.8 2.2 2.6 2.1 2.2 2.0 2.0 2.2 2.2 2.3 2.0 2.0 2.2 2.3 2.9 2.4 2.3 2.1
1.5 1.4 1.8 2.1 2.3 2.0 1.7 1.9 2.0 2.0 1.9 1.6 1.6 1.6 1.7 1.7 1.5 1.7 1.9 1.7 2.0 2.0 2.2 2.1 1.8 1.6 1.4 1.5 1.5 1.6 1.6 1.6 1.9 1.8
1.6 1.3 1.4 1.7 1.9 2.2 1.9 1.7 1.9 2.2 1.6 1.6 1.8 2.0 1.6 1.4 1.2 1.2 1.5 1.7 1.7 1.8 2.1 2.2 2.2 2.0 2.0 1.7 1.9 1.7 1.8 1.7 1.6 1.9 1.7
1.6 1.7 1.9 1.8 1.8 2.0 2.0 1.8 1.7 1.5 1.7 1.5 1.8 2.2 2.2 2.3 1.9 1.7 1.5 1.6 1.7 1.6 2.1 2.1 2.3 2.2 2.0 1.9 1.9 1.7 1.7 1.6 1.8 1.7 1.5
1.8 1.9 1.8 2.0 1.8 1.9 1.9 2.1 2.0 1.8 1.7 1.9 1.6 2.0 2.1 2.0 2.1 1.8 1.7 1.7 1.6 1.6 1.5 1.7 2.0 2.1 2.1 2.0 1.9 1.9 1.7 1.8 1.9 1.9 1.9 1.9
1.9 1.8 1.6 1.7 1.6 1.7 1.6 1.6 1.6 1.9 1.7 1.6 1.8 2.0 1.8 1.6 1.7 1.5 1.9 2.0 1.7 1.8 1.5 1.8 1.9 1.7 1.6 1.9

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa	(pressure)
	:25 m s^{-1}	(Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the wind speed > 3 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA-LEVEL PRESSURE											
13556	26.6	-31.9	ALL	MSLP	SUR	157	0	0	1.1	-0.3	1.2
13561	30.9	-21.6	ALL	MSLP	SUR	164	0	0	0.9	0.4	1.0
20504	29.3	-73.0	ALL	MSLP	SUR	1	0	0	0.0	0.2	0.2
20808	26.3	-69.4	ALL	MSLP	SUR	1	0	0	0.0	-0.5	0.5
25561	56.9	-37.3	ALL	MSLP	SUR	531	0	0	3.1	4.0	5.1
40503	15.8	-46.9	ALL	MSLP	SUR	2	0	0	0.6	-1.0	1.2
40608	35.0	-59.1	ALL	MSLP	SUR	2	0	0	0.0	-1.0	1.1
40906	39.6	-54.8	ALL	MSLP	SUR	1	0	0	0.0	-2.9	2.9
41522	24.7	-72.7	ALL	MSLP	SUR	275	0	0	0.9	-0.2	1.0
41523	21.1	-75.8	ALL	MSLP	SUR	25	0	0	1.1	-0.2	1.1
44616	58.2	-10.6	ALL	MSLP	SUR	136	33	24	7.2	-2.4	7.6
44682	53.0	-55.5	ALL	MSLP	SUR	24	0	0	2.3	1.6	2.8
44683	53.6	-56.2	ALL	MSLP	SUR	29	0	0	2.0	0.0	2.0
44684	53.7	-55.3	ALL	MSLP	SUR	31	0	0	2.1	-2.0	2.9
44728	59.9	-5.5	ALL	MSLP	SUR	154	24	16	8.0	-0.2	8.1
44743	35.2	-37.3	ALL	MSLP	SUR	526	27	5	2.6	-0.3	2.6
44760	36.0	-38.1	ALL	MSLP	SUR	446	3	1	1.1	-0.5	1.2
44761	56.6	-32.8	ALL	MSLP	SUR	1362	4	0	2.6	-1.4	2.9
44763	55.0	-34.2	ALL	MSLP	SUR	1047	1	0	2.5	-1.1	2.7
44765	27.8	-52.2	ALL	MSLP	SUR	95	2	2	0.7	0.0	0.7
44769	54.2	-35.6	ALL	MSLP	SUR	310	0	0	1.9	-0.4	2.0
44771	52.1	-35.2	ALL	MSLP	SUR	626	4	1	2.4	-0.2	2.4
44777	50.2	-3.8	ALL	MSLP	SUR	4	1	25	5.2	-8.0	9.6
44778	62.5	-15.4	ALL	MSLP	SUR	1498	3	0	2.1	0.5	2.2
44779	57.7	-7.0	ALL	MSLP	SUR	58	0	0	2.3	3.1	3.9
60659	11.1	-65.5	ALL	MSLP	SUR	1	0	0	0.0	-1.8	1.8
62501	48.6	-10.7	ALL	MSLP	SUR	261	0	0	1.6	2.0	2.6
62502	46.0	-5.6	ALL	MSLP	SUR	190	0	0	1.6	-0.3	1.6
62503	48.3	-13.6	ALL	MSLP	SUR	230	0	0	3.2	0.8	3.3
62504	48.9	-13.6	ALL	MSLP	SUR	257	0	0	1.7	-0.3	1.8
62505	47.9	-13.6	ALL	MSLP	SUR	350	0	0	1.7	-0.7	1.9
62506	46.9	-13.8	ALL	MSLP	SUR	351	0	0	1.8	-0.2	1.8
62514	40.8	-16.2	ALL	MSLP	SUR	242	0	0	1.0	-0.7	1.2
62524	36.6	-22.3	ALL	MSLP	SUR	976	1	0	1.0	0.3	1.0
62601	20.0	-59.1	ALL	MSLP	SUR	262	0	0	0.9	0.2	0.9
62606	37.4	-9.3	ALL	MSLP	SUR	232	0	0	0.9	0.6	1.1
62673	59.6	-34.3	ALL	MSLP	SUR	3	0	0	1.6	1.4	2.1
62695	38.5	-22.0	ALL	MSLP	SUR	129	0	0	0.9	0.3	1.0
62696	59.3	-21.3	ALL	MSLP	SUR	772	1	0	2.1	0.6	2.2
62711	62.2	-13.6	ALL	MSLP	SUR	1392	1	0	2.0	0.6	2.1
64528	61.9	-29.6	ALL	MSLP	SUR	1263	1	0	2.6	-0.1	2.6
65592	62.8	-31.7	ALL	MSLP	SUR	1366	21	2	2.9	-0.1	2.9
WIND SPEED											
13556	26.6	-31.9	ALL	SPEED	SUR	496	0	0	1.3	-1.8	2.2
13561	30.9	-21.6	ALL	SPEED	SUR	484	0	0	1.5	-1.0	1.8
20504	29.3	-73.0	ALL	SPEED	SUR	1	0	0	0.0	6.7	6.7
20808	26.3	-69.4	ALL	SPEED	SUR	1	0	0	0.0	5.0	5.0
40503	15.8	-46.9	ALL	SPEED	SUR	2	0	0	0.4	-0.4	0.6
40608	35.0	-59.1	ALL	SPEED	SUR	2	0	0	1.2	0.8	1.4
40906	39.6	-54.8	ALL	SPEED	SUR	1	0	0	0.0	2.2	2.2
44616	58.2	-10.6	ALL	SPEED	SUR	60	0	0	3.4	-10.3	10.9
44728	59.9	-5.5	ALL	SPEED	SUR	154	0	0	2.3	-5.7	6.1
44769	54.2	-35.6	ALL	SPEED	SUR	132	0	0	4.4	-7.7	8.9
44771	52.1	-35.2	ALL	SPEED	SUR	238	1	0	4.4	-8.7	9.8
60659	11.1	-65.5	ALL	SPEED	SUR	1	0	0	0.0	2.5	2.5
62502	46.0	-5.6	ALL	SPEED	SUR	537	0	0	1.7	-0.2	1.7
62505	47.9	-13.6	ALL	SPEED	SUR	241	0	0	1.8	-0.6	1.9
62506	46.9	-13.8	ALL	SPEED	SUR	246	0	0	1.5	-0.9	1.7

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
62696	59.3	-21.3	ALL	SPEED	SUR	184	0	0	4.0	-11.4	12.1
WIND DIRECTION											
13556	26.6	-31.9	ALL	DIRN.	SUR	390	0	0	15.6	2.9	15.8
13561	30.9	-21.6	ALL	DIRN.	SUR	445	0	0	14.2	-1.9	14.4
20504	29.3	-73.0	ALL	DIRN.	SUR	1	0	0	0.0	29.0	29.0
20808	26.3	-69.4	ALL	DIRN.	SUR	1	0	0	0.0	-5.8	5.8
40503	15.8	-46.9	ALL	DIRN.	SUR	1	0	0	0.0	-20.1	20.1
40608	35.0	-59.1	ALL	DIRN.	SUR	2	0	0	27.1	-1.2	27.1
40906	39.6	-54.8	ALL	DIRN.	SUR	1	0	0	0.0	-26.6	26.6
44616	58.2	-10.6	ALL	DIRN.	SUR	54	0	0	93.1	63.1	112.4
44728	59.9	-5.5	ALL	DIRN.	SUR	138	0	0	44.5	15.9	47.2
44769	54.2	-35.6	ALL	DIRN.	SUR	71	0	0	90.8	22.6	93.5
44771	52.1	-35.2	ALL	DIRN.	SUR	191	1	1	100.6	42.3	109.1
60659	11.1	-65.5	ALL	DIRN.	SUR	1	0	0	0.0	14.7	14.7
62502	46.0	-5.6	ALL	DIRN.	SUR	336	0	0	18.3	-13.6	22.8
62505	47.9	-13.6	ALL	DIRN.	SUR	230	0	0	16.2	-5.4	17.1
62506	46.9	-13.8	ALL	DIRN.	SUR	240	0	0	15.6	-3.6	16.0
62696	59.3	-21.3	ALL	DIRN.	SUR	180	0	0	47.0	64.1	79.5

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in $m\ s^{-1}$

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	610	0	2	2.1	-0.3	626	0	2	0	8.1	0.8
ACA	308	0	1	2.2	-0.8	319	0	0	0	7.2	0.0
AEA	48	0	2	2.3	0.1	49	0	0	0	10.9	0.8
AEL	150	2	9	2.1	-0.4	159	1	7	0	9.5	0.8
AFL	87	8	100	4.8	3.5	88	1	100	0	14.3	0.3
AFR	343	1	7	1.9	0.2	348	0	7	0	8.4	0.8
AMX	149	1	2	2.4	-0.6	151	0	1	0	9.2	0.0
ANZ	134	0	5	1.9	-1.0	138	1	5	0	7.0	0.4
AOM	175	1	3	2.2	0.8	181	0	2	0	8.6	-0.5
AVA	104	2	2	2.0	-0.8	104	0	3	0	9.3	1.6
AVY	29	0	10	2.8	-1.6	29	0	3	3	11.1	2.1
AZA	260	0	2	2.6	1.5	262	0	3	0	9.2	0.7
BAL	32	0	22	3.2	-0.4	35	0	14	0	8.4	1.0
BAW	378	0	6	2.1	0.2	391	0	7	1	8.0	1.1
BWA	107	0	2	2.1	0.5	113	0	4	0	9.2	1.6
CDN	233	1	5	1.9	0.8	233	0	6	1	7.5	0.6
CFG	241	0	73	2.6	-1.4	246	0	4	0	10.4	0.5
CKS	27	0	100	5.7	-3.1	28	0	100	0	24.8	1.4
CLX	43	0	7	2.1	-0.4	44	0	7	0	11.4	2.5
COA	118	0	1	1.7	0.5	123	1	4	1	7.8	0.4
CRL	45	2	7	1.2	-0.2	46	0	9	0	9.1	0.9
CUB	60	8	45	2.9	0.9	59	0	12	0	10.5	-0.2
DAL	1052	0	1	2.0	0.0	1078	0	2	0	9.1	1.6
DHL	85	1	8	3.7	-0.3	85	0	69	0	11.8	1.4
DLH	1035	1	7	2.0	-0.2	1051	0	9	2	8.4	1.1
DOA	37	0	14	1.7	-0.6	41	0	15	0	9.0	0.0
EIA	132	3	11	3.0	0.1	143	0	10	0	13.3	2.1
ELY	94	1	7	1.7	-0.5	97	0	10	0	7.6	0.3
FDX	243	0	2	2.2	1.2	254	0	2	0	9.2	0.5
FIN	231	2	3	2.0	0.6	232	0	3	1	9.9	0.5
GAF	35	3	6	2.6	-1.1	35	0	6	3	8.0	1.4
HLF	52	2	69	2.3	-0.6	53	0	2	0	10.3	0.9
HZM	24	0	4	2.0	0.9	24	0	4	0	10.7	-0.6
IBE	535	0	19	2.0	0.4	538	0	20	0	10.1	0.9
ICE	275	1	1	2.2	-0.2	276	0	1	0	9.1	1.5
KLM	659	1	2	2.0	0.2	680	0	2	0	8.3	0.7
LDA	93	0	63	2.2	-1.2	94	0	13	0	9.0	0.3
LDI	80	1	76	2.6	-1.8	82	0	5	0	11.2	-0.1
LIB	35	0	3	1.1	-0.1	37	0	5	0	5.2	-0.8
LOT	198	0	1	2.3	0.4	200	0	2	1	8.5	1.2
LTU	256	0	2	2.0	0.1	264	0	3	0	9.7	1.0
MAH	59	0	2	2.2	-0.6	61	0	2	0	6.2	0.1
MPH	167	1	2	1.8	0.1	167	0	3	0	9.2	0.7
NWA	1571	1	2	2.2	1.0	1609	0	2	0	9.0	1.3
RRR	141	1	22	2.7	-0.5	141	0	25	2	9.8	2.6
SAS	1143	0	1	1.8	0.2	1147	0	2	1	7.7	0.5
SIA	20	0	5	2.5	-0.6	21	0	0	0	9.1	-0.1
SPP	38	0	0	2.1	-0.7	38	0	3	0	8.1	0.4
SVA	67	0	0	1.5	0.4	68	0	3	0	9.6	2.1
SWR	66	0	5	1.6	0.0	72	0	3	0	8.7	1.4
TAP	232	0	2	2.0	-0.7	231	0	3	0	9.7	1.1
TOW	57	2	0	2.0	0.2	59	0	2	0	9.0	3.2
TWA	496	0	3	2.1	0.4	506	0	2	0	9.4	1.2
UAL	887	1	4	2.2	-0.1	911	0	4	2	9.0	0.7
ULE	57	0	0	1.6	0.3	59	0	0	0	7.6	1.9
UPS	266	1	17	2.0	-0.4	274	0	19	0	10.3	0.8
VIA	66	2	12	2.1	-0.3	67	0	9	0	7.9	1.5
WOA	33	0	12	1.7	-0.5	33	0	12	0	9.9	4.1

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
BA	6591	0	6	2.0	0.4	6583	0	6	0	8.4	1.5
KL	918	0	100	2.8	2.3	915	0	16	0	8.5	1.7
LH	29	0	0	1.7	0.1	29	0	3	3	8.1	1.1
NW	22	0	9	1.4	0.4	22	0	9	0	6.3	3.1

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
M	83	6	48	3.2	0.1	96	1	15	0	13.1	1.1
N	138	2	4	2.9	0.1	143	0	2	0	11.1	0.0

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
 WMO   OBS             NUM   NUM
IDENT TIME ELM   LEV   OBS  GROSS     SD     RMS    BIAS

DBB    00   Z    100    1     0      0.0    35.0   -35.0
DBBH   00   Z    100   10     0     14.8    32.1   -28.5
DBBH   12   Z    100   12     0     27.7    30.6   -12.9
FNOR   00   Z    100   15     0     24.2    25.5     8.0
FNOR   12   Z    100   13     0     21.1    21.9     5.5

FNOU   00   Z    100   12     0     11.4    20.2    16.8
FNOU   12   Z    100    8     0     15.1    17.9     9.6
FNPH   00   Z    100   12     0     22.3    23.0    -5.9
FNPH   12   Z    100   13     0     26.0    27.6    -9.3
FNRS   00   Z    100   13     0     32.0    45.2    32.0

FNRS   12   Z    100   11     0     21.9    27.4    16.5
GACA   00   Z    100   27     0     15.1    25.2    20.2
GACA   12   Z    100   28     0     17.6    28.8    22.8
JIVB   00   Z    100    1     0      0.0    58.0    58.0
LDWR   00   Z    100   29     0     20.3    22.5     9.5

LDWR   12   Z    100   29     0     22.3    31.9    22.8
OXYL   00   Z    100   17     0     41.1    41.4     5.1
OXYL   12   Z    100   20     0     28.8    41.3    29.5
OZJP   00   Z    100   11     0     26.4    27.1    -6.1
OZJP   12   Z    100   11     0     14.9    19.4    12.5

P3OO4  00   Z    100   15     0     15.4    15.5    -1.9
P3OO4  12   Z    100   14     0     29.7    30.6     7.3
P3004  00   Z    100    1     0      0.0     4.0    -4.0
SHIP   12   Z    100    1     0      0.0    77.0    77.0
SHIP DD00   Z    100    1     0      0.0     5.0     5.0

SHIPA  00   Z    100    2     0      2.5    15.7    15.5
SHIPAA 00   Z    100   18     0     20.0    30.5    23.1
SHIPAA 12   Z    100   17     1     27.4    42.1    32.0
UQYC   00   Z    100    1     0      0.0    29.0    29.0
V2 X   00   Z    100    1     0      0.0     9.0    -9.0

V2LV   00   Z    100   25     0     30.5    36.2    19.6
V2LV   12   Z    100   23     0     43.2    45.8    15.2
V2LX   00   Z    100   23     0     27.7    27.7    -0.4
V2LX   12   Z    100   24     0     30.1    30.8     7.0
ZCAW6  00   Z    100   14     0     21.1    26.3    15.7

ZCAW6  12   Z    100   10     0     18.5    32.1    26.3
ZDLG   00   Z    100    1     0      0.0    39.0    39.0
ZDLG   12   Z    100    1     0      0.0    10.0    10.0
03953  00   Z    100   22     0     16.8    25.2    18.8
03953  12   Z    100   27     0     17.0    32.6    27.8

04018  00   Z    100   26     0     21.5    30.6    21.7
04018  12   Z    100   29     0     19.0    29.4    22.4
04220  00   Z    100   31     0     23.6    32.3    22.0
04220  12   Z    100   31     0     20.2    33.7    26.9
04270  00   Z    100   30     0     25.8    35.4    24.3

04270  12   Z    100   29     0     24.2    35.6    26.1
04339  00   Z    100   28     0     25.3    31.4    18.5
04339  12   Z    100   30     0     19.2    35.8    30.2
04360  00   Z    100   30     0     23.2    26.3    12.3
04360  12   Z    100   28     0     17.9    25.1    17.7

08001  00   Z    100   20     0     23.4    32.1    22.0
08001  12   Z    100   17     0     17.7    42.8    38.9
08508  00   Z    100   31     0     29.3    34.5    18.3
08508  12   Z    100   28     0     35.4    38.9    16.3
08594  00   Z    100    1     0      0.0     5.0    -5.0

08594  12   Z    100   26     0     16.1    16.1    -0.6
60020  00   Z    100   31     0     29.5    29.5    -1.4
60020  12   Z    100   29     0     17.4    17.8     3.6
71600  00   Z    100   27     0     31.6    35.8    16.9
71600  12   Z    100   18     0     11.9    34.8    32.7
```

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
72201	00	Z	100	28	0	25.8	43.2	34.6
72201	12	Z	100	29	0	16.8	43.0	39.6
72304	00	Z	100	28	0	24.3	32.3	21.2
72304	12	Z	100	27	0	29.0	43.7	32.7
72402	00	Z	100	26	0	26.3	33.9	21.4
72402	12	Z	100	29	0	20.9	39.0	33.0
72606	00	Z	100	28	0	19.2	23.3	-13.2
72606	12	Z	100	30	0	17.1	20.4	11.1
74494	00	Z	100	26	0	21.1	29.7	-20.8
74494	12	Z	100	31	0	29.8	31.1	9.1
78016	12	Z	100	16	0	23.7	49.3	43.2

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures:

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :GEOPOTENTIAL HEIGHT in metres

Parameters monitored :NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DBB	00	Z	500	1	0	0.0	3.0	3.0
DBBH	00	Z	500	10	0	7.6	12.0	-9.3
DBBH	12	Z	500	10	0	6.4	13.2	-11.6
FNOR	00	Z	500	15	0	11.5	17.7	13.5
FNOR	12	Z	500	14	0	9.1	10.7	5.6
FNOU	00	Z	500	15	0	13.8	19.2	13.4
FNOU	12	Z	500	11	0	9.8	13.3	8.9
FNPH	00	Z	500	12	0	11.5	12.5	-5.1
FNPH	12	Z	500	14	0	7.9	9.4	-5.1
FNRS	00	Z	500	15	0	13.7	17.6	11.0
FNRS	12	Z	500	13	0	14.4	14.8	3.5
GACA	00	Z	500	27	0	17.1	17.9	5.5
GACA	12	Z	500	28	0	22.8	22.8	-0.8
JIVB	00	Z	500	1	0	0.0	16.0	16.0
LDWR	00	Z	500	28	0	12.5	19.2	14.5
LDWR	12	Z	500	29	0	18.4	21.3	10.8
OXYL	00	Z	500	18	0	16.6	18.2	7.7
OXYL	12	Z	500	20	0	14.4	15.6	6.0
OZJP	00	Z	500	11	0	17.9	18.0	0.9
OZJP	12	Z	500	12	0	13.4	14.8	6.3
P3OO4	00	Z	500	15	0	13.9	14.1	-2.2
P3OO4	12	Z	500	14	0	12.9	13.2	-2.9
P3004	00	Z	500	1	0	0.0	15.0	-15.0
SHIP	00	Z	500	2	0	13.5	15.4	7.5
SHIP	12	Z	500	2	0	4.0	23.3	23.0
SHIP DD	00	Z	500	1	0	0.0	3.0	-3.0
SHIPA	00	Z	500	2	0	2.0	9.2	-9.0
SHIPAA	00	Z	500	21	0	9.2	11.2	6.4
SHIPAA	12	Z	500	19	0	10.3	10.8	3.1
UQYC	00	Z	500	1	0	0.0	26.0	26.0
V2 X	00	Z	500	1	0	0.0	12.0	12.0
V2LV	00	Z	500	26	0	18.1	21.9	12.2
V2LV	12	Z	500	27	0	22.9	23.5	5.1
V2LX	00	Z	500	25	0	16.1	18.5	9.1
V2LX	12	Z	500	24	0	16.8	18.0	6.3
WTEA	00	Z	500	1	0	0.0	30.0	30.0
ZCAW6	00	Z	500	14	0	15.9	15.9	-0.2
ZCAW6	12	Z	500	10	0	8.2	11.0	-7.4
ZDLG	00	Z	500	1	0	0.0	10.0	10.0
ZDLG	12	Z	500	1	0	0.0	16.0	16.0
03953	00	Z	500	31	0	12.5	16.1	10.2
03953	12	Z	500	31	0	13.4	15.0	6.9
04018	00	Z	500	31	0	19.9	24.6	14.4
04018	12	Z	500	30	0	16.0	19.6	11.3
04220	00	Z	500	31	0	17.2	20.4	10.9
04220	12	Z	500	31	0	16.8	20.2	11.3
04270	00	Z	500	31	0	16.5	17.8	6.7
04270	12	Z	500	30	0	21.1	23.2	9.6
04339	00	Z	500	29	0	17.9	22.1	13.0
04339	12	Z	500	31	0	18.6	26.0	18.2
04360	00	Z	500	30	0	15.0	15.1	-2.2
04360	12	Z	500	30	0	15.3	15.5	-2.3
08001	00	Z	500	20	0	16.7	23.8	16.8
08001	12	Z	500	17	0	14.9	20.5	14.1
08508	00	Z	500	30	0	24.5	33.1	22.3
08508	12	Z	500	29	0	17.6	24.4	16.9
08594	00	Z	500	1	0	0.0	9.0	9.0
08594	12	Z	500	27	0	11.9	12.2	2.8
60020	00	Z	500	31	0	13.8	15.6	7.4
60020	12	Z	500	27	0	13.2	15.7	8.4

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
71600	00	Z	500	30	0	18.3	18.5	2.6
71600	12	Z	500	31	0	13.1	13.1	0.2
72201	00	Z	500	29	0	8.6	13.6	10.5
72201	12	Z	500	30	0	8.5	14.4	11.6
72304	00	Z	500	30	0	14.5	15.6	5.6
72304	12	Z	500	31	0	10.1	11.2	4.9
72402	00	Z	500	28	0	13.6	15.5	7.4
72402	12	Z	500	31	0	15.6	17.5	7.9
72606	00	Z	500	30	0	13.0	13.1	1.0
72606	12	Z	500	31	0	14.7	14.7	-0.8
74494	00	Z	500	30	0	25.2	25.2	0.5
74494	12	Z	500	31	0	19.5	20.4	-5.9
78016	12	Z	500	25	0	10.8	22.1	19.3

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBB	00	V	100	1	0	0	0.0	-3.8	-1.4
DBBH	00	V	100	9	0	0	0.0	-2.3	0.7
DBBH	12	V	100	12	0	0	5.3	-2.2	0.6
FNOR	00	V	100	15	0	0	3.7	-0.2	-0.2
FNOR	12	V	100	13	0	0	3.2	-2.1	-1.3
FNOU	00	V	100	12	0	0	2.6	0.7	1.1
FNOU	12	V	100	8	0	0	3.9	-0.1	-0.9
FNPH	00	V	100	12	0	0	3.9	-2.5	0.0
FNPH	12	V	100	13	0	0	5.1	-2.2	-1.3
FNRS	00	V	100	12	0	0	4.1	-0.9	-1.2
FNRS	12	V	100	9	0	0	3.0	-6.8	-0.4
GACA	00	V	100	27	0	0	3.0	-1.6	-0.1
GACA	12	V	100	27	0	0	3.0	-1.8	-1.4
JIVB	00	V	100	1	0	0	2.8	-0.8	4.7
LDWR	00	V	100	29	0	0	2.8	0.0	-1.1
LDWR	12	V	100	28	0	0	2.9	-0.4	-1.7
OXYL	00	V	100	17	0	0	2.3	0.6	0.0
OXYL	12	V	100	19	0	0	2.6	-0.4	-0.4
OZJP	00	V	100	10	0	0	1.8	-0.5	-0.3
OZJP	12	V	100	11	0	0	2.5	-0.3	-1.5
P3OO4	00	V	100	15	0	0	2.3	-0.5	0.4
P3OO4	12	V	100	14	0	0	4.1	-3.2	0.8
P3004	00	V	100	1	0	0	2.9	-0.2	-0.2
SHIP	12	V	100	1	0	0	2.9	-4.0	-0.2
SHIP	DD00	V	100	1	0	0	2.9	-3.1	2.2
SHIPA	00	V	100	2	0	0	2.9	3.9	-4.1
SHIPAA	00	V	100	13	0	0	2.9	0.8	-2.2
SHIPAA	12	V	100	19	0	0	3.4	-0.2	0.0
UQYC	00	V	100	1	0	0	3.1	1.1	-1.8
V2LV	00	V	100	25	0	0	2.6	-0.2	0.4
V2LV	12	V	100	23	0	0	4.2	-2.5	0.2
V2LX	00	V	100	23	0	0	4.8	-0.6	0.8
V2LX	12	V	100	24	0	0	4.3	-0.4	0.9
ZCAW6	00	V	100	14	0	0	4.6	-0.2	-1.2
ZCAW6	12	V	100	10	0	0	3.4	-0.2	0.1
ZDLG	00	V	100	1	0	0	3.7	1.3	1.6
ZDLG	12	V	100	1	0	0	3.4	0.6	1.2
03953	00	V	100	21	0	0	4.0	-1.6	1.0
03953	12	V	100	27	0	0	3.2	-3.5	0.0
04018	00	V	100	23	0	0	4.0	1.3	-0.3
04018	12	V	100	28	0	0	2.4	-0.5	-0.5
04220	00	V	100	31	0	0	1.8	0.8	0.5
04220	12	V	100	30	0	0	2.7	0.2	-0.1
04270	00	V	100	30	0	0	3.4	0.9	-0.9
04270	12	V	100	28	0	0	4.1	0.5	-0.8
04339	00	V	100	27	0	0	2.2	-0.1	-0.2
04339	12	V	100	29	0	0	2.1	0.1	-1.0
04360	00	V	100	29	0	0	3.2	0.4	0.2
04360	12	V	100	27	0	0	2.9	-0.3	-0.4
08001	00	V	100	20	0	0	2.8	0.5	0.5
08001	12	V	100	17	0	0	2.8	-2.2	0.3
08508	00	V	100	31	0	0	2.4	1.1	-0.7
08508	12	V	100	28	0	0	3.8	-0.3	-1.4
08594	00	V	100	1	0	0	2.7	-0.2	2.0
08594	12	V	100	26	0	0	2.7	-2.6	2.4
60020	00	V	100	31	0	0	3.6	1.6	1.0
60020	12	V	100	29	0	0	4.1	-0.3	3.1
71600	00	V	100	27	0	0	3.8	-0.1	0.7
71600	12	V	100	16	0	0	3.9	1.2	1.5
72201	00	V	100	26	0	3	4.2	1.2	-1.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
72201	12	V	100	25	0	0	6.7	1.3	-1.0
72304	00	V	100	25	0	0	4.3	-1.4	0.3
72304	12	V	100	25	0	0	6.7	-0.9	1.3
72402	00	V	100	20	0	0	3.5	-1.4	0.3
72402	12	V	100	26	0	0	4.6	0.9	-0.1
72606	00	V	100	21	0	0	3.4	-0.3	0.9
72606	12	V	100	24	0	0	4.2	0.7	0.0
74494	00	V	100	22	0	0	3.6	0.5	1.2
74494	12	V	100	31	0	0	2.2	0.3	0.4
78016	12	V	100	16	0	0	7.6	-0.3	-0.3

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:MARCH, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :VECTOR WIND in $m\ s^{-1}$

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:UBIAS,VBIAS:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBB	00	V	500	1	0	0	0.0	0.9	1.4
DBBH	00	V	500	10	0	0	0.0	0.2	1.2
DBBH	12	V	500	10	0	0	2.8	0.6	1.0
FNOR	00	V	500	15	0	0	4.6	0.7	0.7
FNOR	12	V	500	14	0	0	3.0	1.5	2.1
FNOU	00	V	500	15	0	0	4.7	1.1	-0.8
FNOU	12	V	500	11	0	0	3.0	0.2	0.0
FNPH	00	V	500	12	0	0	2.8	0.6	-0.2
FNPH	12	V	500	14	0	0	4.2	0.2	-0.4
FNRS	00	V	500	14	0	0	2.2	-0.8	0.6
FNRS	12	V	500	12	0	0	4.5	-1.4	-1.1
GACA	00	V	500	27	0	0	4.7	0.2	-1.3
GACA	12	V	500	28	0	0	6.2	0.8	-0.5
JIVB	00	V	500	1	0	0	5.5	0.2	2.1
LDWR	00	V	500	28	0	3	5.5	-0.4	0.4
LDWR	12	V	500	29	0	0	3.4	0.1	1.3
OXYL	00	V	500	18	0	0	4.9	-0.6	1.5
OXYL	12	V	500	20	0	0	5.1	-1.1	0.2
OZJP	00	V	500	11	0	0	4.3	-0.3	2.6
OZJP	12	V	500	12	0	0	4.1	-0.8	0.2
P3OO4	00	V	500	15	0	0	2.9	0.0	0.8
P3OO4	12	V	500	14	0	0	2.4	-0.7	-1.2
P3004	00	V	500	1	0	0	2.3	0.5	-1.2
SHIP	00	V	500	2	0	0	2.3	-0.2	-0.1
SHIP	12	V	500	1	0	0	2.3	2.1	-1.9
SHIP DD	00	V	500	1	0	0	2.3	0.8	-1.2
SHIPA	00	V	500	2	0	0	2.3	2.0	1.1
SHIPAA	00	V	500	22	0	0	2.3	1.6	0.5
SHIPAA	12	V	500	19	0	0	3.1	0.4	0.6
UQYC	00	V	500	1	0	0	2.8	0.9	1.5
V2 X	00	V	500	1	0	0	5.1	4.0	1.3
V2LV	00	V	500	26	0	3	5.1	0.4	-1.0
V2LV	12	V	500	27	0	0	4.8	-1.8	-0.7
V2LX	00	V	500	25	0	0	4.7	0.6	-0.4
V2LX	12	V	500	23	0	0	3.2	-1.3	-1.3
WTEA	00	V	500	1	0	0	3.4	-0.6	0.2
ZCAW6	00	V	500	14	0	0	4.5	2.0	0.5
ZCAW6	12	V	500	10	0	0	4.8	1.7	-0.5
ZDLG	00	V	500	1	0	100	4.2	3.6	-0.4
ZDLG	12	V	500	1	0	0	4.6	2.9	3.4
03953	00	V	500	31	0	0	4.7	-0.9	0.3
03953	12	V	500	31	0	0	3.4	-1.5	0.1
04018	00	V	500	30	0	0	3.6	-0.2	0.1
04018	12	V	500	30	0	0	4.5	-0.2	0.5
04220	00	V	500	31	0	0	3.8	-0.3	0.2
04220	12	V	500	30	0	0	4.6	-0.8	0.2
04270	00	V	500	30	0	0	4.1	1.3	-1.8
04270	12	V	500	30	0	0	5.5	-0.7	-1.7
04339	00	V	500	29	0	0	3.4	-0.9	1.4
04339	12	V	500	31	0	0	4.4	-1.9	-1.0
04360	00	V	500	29	0	0	4.8	-2.2	1.3
04360	12	V	500	29	0	3	3.8	-2.6	-0.5
08001	00	V	500	20	0	0	2.5	1.5	1.0
08001	12	V	500	17	0	0	3.2	-0.4	0.1
08508	00	V	500	30	0	0	3.1	1.4	0.3
08508	12	V	500	29	0	0	3.8	1.7	1.1
08594	00	V	500	1	0	0	4.1	-6.4	-3.7
08594	12	V	500	27	0	0	4.1	-3.6	-4.2
60020	00	V	500	31	0	0	2.6	-0.7	-1.1
60020	12	V	500	26	0	0	3.6	-0.9	-1.3

```
 WMO   OBS               NUM    NUM     %
IDENT TIME ELM   LEV   OBS   GROSS   REJ     RMS    UBIAS   VBIAS

71600  00   V    500    30      0      0     4.3     0.5     0.5
71600  12   V    500    31      0      3     5.4     0.3    -0.8
72201  00   V    500    28      0      0     6.5     1.1    -1.3
72201  12   V    500    30      0      0     3.4     0.7    -0.8
72304  00   V    500    30      0      0     3.9    -1.0     2.5

72304  12   V    500    29      0      0     3.5     0.2     1.7
72402  00   V    500    26      0      0     2.4     0.5    -0.6
72402  12   V    500    30      0      0     3.4     1.7     0.9
72606  00   V    500    30      0      0     3.6    -1.8    -1.7
72606  12   V    500    31      0      3     3.9     0.2    -0.4

74494  00   V    500    28      0      0     2.7    -0.6    -0.5
74494  12   V    500    31      0      0     3.0    -0.2     1.6
78016  12   V    500    25      0      0     9.5     0.5     0.7
```

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5,10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Tables 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45